# AMATEUR TELEVISION QUARTERLY

$3.95

VOLUME 10 #1
WINTER 1997

ISSN 1042-198X
USPS 003-353

*JACK K8MA with 4 OAL BIG WHEELS*

**BUILD: 10 watt 13 cm amp, ultimate sync detector, 3.3 GHz power amp, waveguide for microwave projects, two omni antennas**

**Cumulative Index**

**North Texas UHF/SHF band plan Proposals**

**AND MUCH MORE!**

# PAULDON ASSOCIATES

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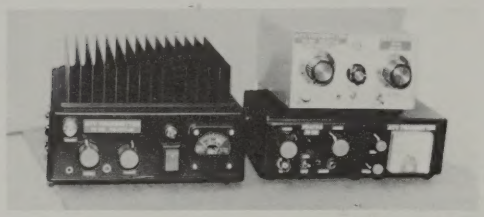

## Video Modulators and Power Amplifiers
### Multi-Channel 57-60 included
### 421.25-439.25 MHz
AM Video---Audio sound---Digital readout

| | | |
|---|---|---|
| 7w P.E.P. Power Amplifier included no T/R | PD-440NA | $225.00 |
| 7w P.E.P. Power Amplifier included T/R | PD-440NTR | $295.00 |
| 10w P.E.P. ATV Transmitter boards (Completely wired and tested video and audio) | | |
| 4 Freq. switchable | PD-ATV-5K | $200.00 |
| 1 Freq. included | Extra Xtals | $16.00ea. |

## FM Boards 33cm and 23cm
20mw P.E.P. (Completely wired and tested video and audio)

| | | |
|---|---|---|
| 2 Freq. switchable | PD-900FMK | $170.00 |
| 1 Freq. included | (Additional information available on request) | |

## 70cm and 33cm Downconverters

Diecast enclosures ..... $92.00

## Power Amplifiers
### 70cm

| | | |
|---|---|---|
| PD-440N | 0.5-5w in = 18w out, T/R (linear) | $129.00 |
| PD-440N-1 | 0.5-5w in = 35w out, T/R (linear) | $149.00 |
| PD-440N-2R | 4w in = 55w out, No T/R (linear) | $199.00 |
| PD-440N-2 | 0.5w in = 50w out, T/R (linear) | $285.00 |
| PD-440N-3 | 3-4w in = 50w out, T/R (linear) | $225.00 |
| PD-440N-4 | 3-4w in = 180w P.E.P. (class "A") | $1200.00 |

### Linear 33cm

| | | |
|---|---|---|
| PD-33 VLP-1 | 1mw in = 6w out | $120.00 |
| PD-33 LP | 0.5-1w in = 6-7w out | $135.00 |
| PD-33 HP | 6w in = 18w out | $149.00 |
| PD-33 LHP | 1w in = 18w out | $265.00 |
| PD-33 LHP-1 | 1w in = 16w out, T/R | $305.00 |

### FM 33cm

| | | |
|---|---|---|
| PD-900N | 1w in = 8-10w out | $65.00 |
| PD-900N-1 | 1w in = 20-24 w out | $143.00 |

### Power Amplifier 1.2 GHz, Linear

| | | |
|---|---|---|
| PD-1200N | 1w in = 18w out | $169.00 |
| PD-1200N-1 | 3w in = 36w out | $305.00 |
| PD-1200N-1A | 1w in = 36w out | $375.00 |
| PD-1200N-2 | 1w in = 16w out, T/R | $214.00 |
| PD-1200N-4 | 3w in = 32w out, T/R | $385.00 |
| PD-1200N-5 | 10mw in = 18w out | $295.00 |

## "Rabbit" Transmitters and Receivers (900MHz)
Modified and Standard
2 standard Frequencies
Receiver and transmitter ..... $59.00
Same unit as above modified for P.A. use ..... $69.00

## Power Amplifiers for above 2-4w output
12-13.8 Vdc operation with BNC or "N" connectors PD-33VLP-1 ..... $120.00

If you are dissatisfied with any purchase, you may return within 10 days for a complete refund.
Payment : Bank or P.O. money orders,C.O.D., or Credit card (MC or Visa)

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**E-Mail PauldonHAM@AOL.com**
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# ATV Transmitters and Transceivers
## 420-440 MHz (70cm)
AM Video 10w P.E.P., 2 pos. XTAL switch, 1 XTAL included------$305.00 PD-ATV-5
AM Video 55w P.E.P., 2 pos. XTAL switch, 1 XTAL included------$545.00 PD-ATV-50
AM Video 10w P.E.P., 2 pos. XTAL switch with down converter---$409.00 PD-ATV-4

## 908-925 MHZ (33cm)
AM Video 6w P.E.P.----------$269.00 PD-900-S
Stable saw technology, Available on 906,913,916.50,924 MHZ your choice.
Video output only, Size= 4.5" x 2.5" with fin type heatsink.

AM Video 1w P.E.P.----------$305.00 PD-900
Video and subcarrier audio (3) XTAL's, 2XTAL's included - 910.25 and 923.25 MHz
Size= 4.5" x 7.5" x 1.75"

AM Video 1w P.E.P.----------$389.00 PD-900-D
Video and subcarrier audio (3) XTAL's, 2XTAL's included - 910.25 and 923.25 MHz
T/R switching, meter and sampler, Size= 4.5" x 7.5" x 1.75"

AM Video 18w P.E.P.----------$549.00 PD-900N-3
Video and subcarrier audio (3) XTAL's, 2XTAL's included - 910.25 and 923.25 MHz
Size= 4.5" x 7.5" x 1.75" fin type heatsink.

AM Video 18w P.E.P.----------$599.00 PD-900N-3C
Video and subcarrier audio (3) XTAL's, 2XTAL's included - 910.25 and 923.25 MHz
T/R switching, meter and sampler, Size= 7.5" x 7.5" x 2" fin type heatsink

FM Video 5w P.E.P.----------$319.00 PD-900FM-1
Provisions for 2 XTAL's. 1 included-916 MHz
R.F. phase lock loop and amp sync level adjustment
Subcarrier audio 4.5-6.9 MHz video and audio controls

## 1.2 GHZ (23cm)

FM Video 3w P.E.P.----------$299.00 PD-1200FM-1
Provisions for 2 XTAL's. 1 included-1.265 GHz
R.F. phase lock loop and amp sync level adjustment
Subcarrier audio 4.5-6.9 MHz video and audio controls

## Preamplifiers

### 420-450Mhz specs: (Choice of BNC or "N" connectors)

**PD-440S** Single gate; MGF1302 transistor; Noise Figure = 0.5db; Gain = 16db ..... **$56.00**

**PD-440S-1** Single gate; Noise Figure = 0.38db; MGF1302 transistor; Gain = 17db; 12-13.8 volts required.; Voltage regulated (5v); Toroid coil is in output with capacitor coupling at output; Input uses a high "Q" piston trimmer ..... **$90.00**

### 902-928 Mhz specs: (choice of BNC, "N" , or SMA connectors)

**PD -900** Single gate; Low noise; 0.5 db Noise Figure; MGF 1302 GaAs FET Transistor; Gain = 15 - 16 db; Piston type trimmer capacitor; High "Q" trim pot; Voltage regulated (5v); Fixed inductor ,capacitor isolated output ..... **$89.00**

**TPD-900TM** Tower Mount with "N" connectors ..... **$96.00**

### 1240-1296Mhz specs: (Choice of BNC, "N" , or SMA connectors)

**PD-1200** (Other specs. Available upon request); HEMT Device; Low noise; 0.5 db Noise Figure; Gain = 15db; Voltage regulated ..... **$89.00**

**TPD-1200TM** Tower mount with "N" connectors ..... **$96.00**

### 2.3 Ghz Specs: (Choice of BNC, "N" , or SMA connectors)

**TPD-2300** 3 stages; low noise; Gain = 17 db; Write or call for specs. and layout ..... **$140.00**

## Video line samplers

| | | |
|---|---|---|
| 70cm - 33cm | | |
| Video output | PD-VD-1 | $79.00 |
| Video and R.F. output | PD-VD-1A | $96.00 |

*Call or write for 18 page cataloge.*

# AMATEUR TELEVISION QUARTERLY
## VOLUME 10 #1 WINTER 1997

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Because my TV station work schedule starts at 7 am to 7-9 PM, and most weekends lose at least one day to remotes and other broadcast stuff at my real life job, the best way to "talk" to me is via E-mail or fax, lastly the answering machine. I get to it about once a week. You can also find me at home typically Sundays between 10 and 4 if I'm not working, or Saturday 9 to 3 if I am not working. That's how life is these days. 73 Henry KB9FO

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## *COVER PHOTO*

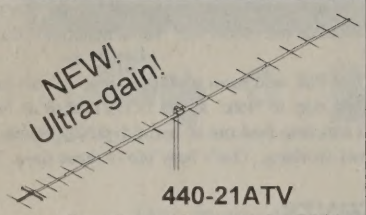
**Jack K8MA with OAL 4 bay Big Wheels for the Detroit ATV Repeater.**

This issue was sent to the printer Dec 11, 1996, to be mailed between Christmas and New Year's.. The deadline for the next issue is February 1, 1997. Your feed back is important. Please take a moment and send in your thoughts. The IN box is empty again! Send in your articles and news for the next spring issue. See you at Dayton!

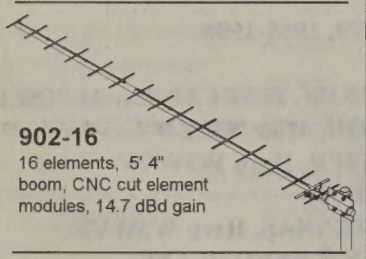
# *GET A FRIEND TO SUBSCRIBE*

***Most ham magazines have seen a decrease in readership. QST now reaches only 25% of the ham population, Westlink Reports ceased publication this year, and ad dollars are harder to come by then ever. While many hams are on the WWW, many more are not. Besides good material, a magazine needs an ever increasing base of subscribers to attract advertisers and good writers this may look like a one person effort, but it isn't. You need to do your part too. Get a friend to subscribe today, and help me keep the ATV community in touch. Please note that due to postal rate changes, some rates are up, and some down. Canada is now closer to US prices. Two subscribers are now busy translating some nice projects to English for publication in the Spring (Dayton) issue. Two others are working on WEB pages where back issues will be posted. Won't you help by being our "subscription agent" in your area? Thanks 73 Henry KB9FO***

# M² YOUR ATV ANTENNA SOURCE ...

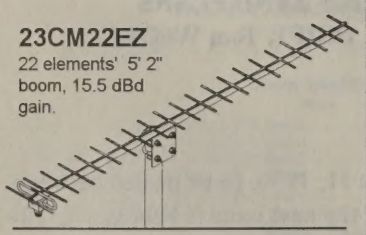



**440-21ATV**
all-weather replacement for FO22, sealed driven element, 14' 5" tapered boom (1-1/2", 1-1/4", 1"), >15.9 dBd gain.



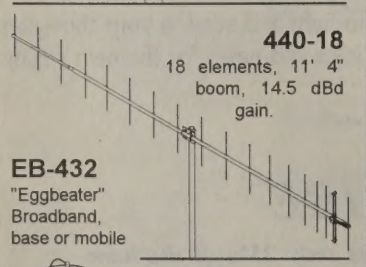
**902-16**
16 elements, 5' 4" boom, CNC cut element modules, 14.7 dBd gain

**23CM22EZ**
22 elements' 5' 2" boom, 15.5 dBd gain.



**440-18**
18 elements, 11' 4" boom, 14.5 dBd gain.

**EB-432**
"Eggbeater" Broadband, base or mobile



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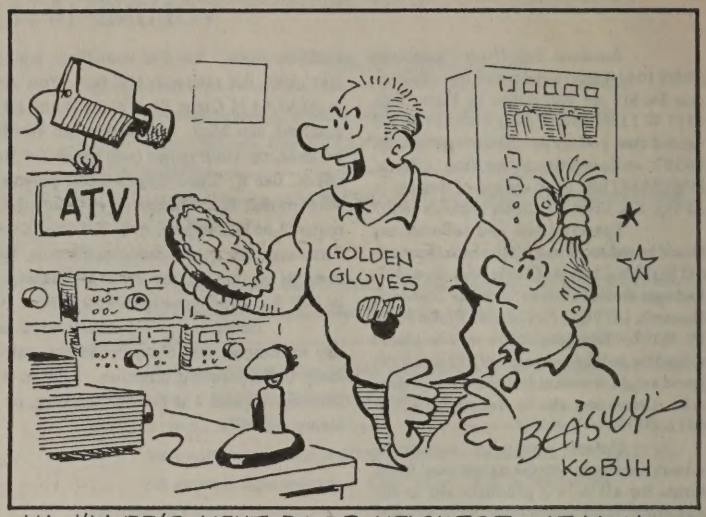


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## *4-SALE*

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***ALSO***
***Radio Shack RTX202, 2 meter radio. (H-T) Won at hamfest, used once. Make offer. Contact Henry at ATVQ.***

# What's WATS?

Waco Amateur Television Society (WATS), Inc. That's what's WATS. It is a non-profit corporation in Waco, Texas. Everyone now knows where Waco is.

Back in April, 1991, before the siege of Mount Carmel, ten (10) mile east of Waco, the local ATV repeater went on the air as W5TAH. With input on 427.25MHz., VSB and output on 923.25MHz., VSB, with vertical polarization, all went well until paging transmitters above the Ham frequencies started tearing up reception of the repeater. Then we found 910.25MHz. put us in the clear and we stayed there.

Early in 1995, four of us, Dick Campbell (N3FKV), John Gafford (N5XAK), Frank Stallings (KC5HKI) and myself (W5TAH), pooled our resources and built a Weather Radar (WxRAD) link transmitter, with output on 427.25MHz., and placed it at the studios of KWTX-TV in Waco. They furnish several different varieties of weather radar and satellite information for the WxRad link. The WxRad link is controlled by DTMF tones sent to it on 145.74MHz., and is viewed (accessed) by a controlled group of Hams plus a Ham who is in charge of the Waco-McLennan County Office of Emergency Management. This is a helpful tool for the weather spotters who work in cooperation with the Office of Emergency Management.

WATS came into being in April of 1995, when the State of Texas issued a charter as a non-profit Corporation. At that time, the W5TAH ATV Repeater was donated to WATS. In May, 1995, the Society received its own license, KC50YN. Also, the owners of the WxRad link donated that facility to WATS. So, now we have a cross-band repeater and a WxRAD link unit, both of which are working like champs.

At the present time, two members of WATS, Larry Bush (W5NCD) and Horace Bushnell (W5TAH), are in the final stages of completing a SKYCAM to be placed on top of a downtown Waco building. Upon completion, the SKYCAM will also become property of WATS. With this completed, we hope to enjoy the beautiful scenery up and down Lake Brazos, with sailboats from Baylor University, as well as beautiful coeds from Baylor. Our SKYCAM is in a commercial enclosure, with heat strips and a blower and is on a commercial pan/tilt head, which rotates 355 degrees and tilts 90 degrees. We'll up-date you later. 73 from Waco. Horace BushnelL W5TAH


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## REPRINTS:

*. A selection of about 100 technical items fills our 300 page book, TV Secrets Vol II available for $27.45 post paid. (All prices US, additional postage required elsewhere) Visa, Mastercard accepted. other reprints available from ESF Copy Service, 4011 Clearview Dr., Cedar Falls, IA, 50613 319-266-7040*

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| SUPER FRONT TO BACK RATIO | WA6SVT | 1 | V6 #4 |
| HORIZONTAL OMNI ANTENNA WITH GAIN | ATCO | 3 | V6 #4 |
| CHEAP ALFORD SLOT OMNI GAIN ANTENNA | HI-SPEC | 1 | V6 #4 |
| ATCO SLOT ANTENNA | WA8RMC | 2 | V7 #1 |
| QUICK GROUNDPLANE FOR 144/440 MHZ | LIARC | 1 | V7 #2 |
| HAM SUES CONDO OVER ANTENNA RESTRICTIONS | | 1 | V7 #2 |
| HOG FENCE ANTENNA FOR 440 ATV | KD4SHH | 2 | V7 #3 |
| 48 ELEMENT COLLINEAR FOR 439 MHZ | WA8RMC | 3 | V7 #3 |
| DIAMOND OFFERS ATV ANTENNA | | 1 | V7 #3 |
| SWIECH ANTENNAS (REVIEW) | WA6SVT | 1 | V7 #4 |
| DUAL BAND MAG WHEEL FOR MOBILE ATV | W6OAL | 2 | V7 #4 |
| IMPROVING IMPEDANCE BANDWIDTH OF YAGI | VHF COM | 5 | V7 #4 |
| STACKING ANTENNAS | M2 ANT | 1 | V8 #1 |
| 2 LOOP DISH FEED FOR 2.4 GHZ | KF6YN | 1 | V8 #2 |
| BUILD YOUR OWN WHEEL ANTENNAS | ATCO | 2 | V8 #3 |
| ANTENNA MOUNTING | WA8RUT | 1 | V9 #1 |
| DUAL BAND MAG WHEEL FOR MOBILE ATV | W6OAL | 2 | V9 #1 |
| BALUN FOR ALFORD SLOT ANTENNA | KB0GL | 1 | V9 #2 |
| ANTENNA STACKING DISTANCE | W8DMR | 1 | V9 #2 |
| ANTENNA ROTOR SCHEMATICS | W8DMR | 1 | V9 #2 |
| OMNI ANTENNAS FOR ROCKETS ETC | W6ORG | 1 | V9 #3 |
| RELIABILITY OF GAIN SPECS FOR ANTENNAS | OZ9ZI | 4 | V9 #3 |
| TWO OMNI ANTENNAS FOR UHF/SHF | W3WVV | 3 | V10 #1 |

# AUDIO

| | | | |
|---|---|---|---|
| DIGITAL VOICE ID FROM DAK | WB8ELK | 1 | V2 #2 |
| FM AUDIO FOR TX-A5-33 | K8PYQ | 1 | V2 #3 |
| SOUND FOR YOUR ATV STUDIO | GOODE | 2 | V3 #1 |
| 4.5 MHZ AUDIO FM MODULATOR | N9BRL | 1 | V5 #4 |
| NICAM DIGITAL STEREO | G8KUW | 1 | V6 #1 |
| A GREATLY IMPROVED SOUND SYSTEM | W9NTP | 6 | V6 #4 |
| ATV AUDIO SQUELCH | KF0WD | 3 | V7 #4 |
| IC AUDIO SUBCARRIER GENERATOR | KC6GAG | 1 | V8 #2 |
| STEREO AUDIO AND VIDEO MODULATOR CHIPS | KB9FO | 1 | V8 #2 |
| MIC PREAMP AND SUBCARRIER OSCILLATOR | N6RF | 1 | V8 #2 |

## COAX

| | | | |
|---|---|---|---|
| INEXPENSIVE HELIAX CONNECTORS | WD5BJW | 1 | V2 #2 |
| TESTING BASE STATION COAX | KINLEY | 6 | V2 #2 |
| 75 OHM HARDLINE COAX MATCHING SECTIONS | W8ZD | 1 | V2 #4 |
| MICROWAVE OVEN FEED LINE | ATCO | 1 | V3 #4 |
| 9913 COAX SOURCE (FLEX) | W8DMR | 1 | V3 #4 |
| 10 GHZ WAVEGUIDE | P5 | 1 | V6 #2 |
| STUB TUNERS, LINE STRETCHERS AND SLUG TUNERS | MICROLAB | 5 | V7 #1 |
| NEW LOS LOSS COAX FOR MOBILE | PERLMAN | 2 | V7 #3 |
| MAKE YOUR OWN CHEAP WAVEGUIDE | W3WVV | 4 | V10 #1 |
| LMR SERIES COAX LOSS TABLE | - | 1 | V10 #1 |

## FILTERS

| | | | |
|---|---|---|---|
| ATV INTERDIGITAL FILTERS | W1NRE | 4 | V2 #2 |
| ATV COMBLINE DUPLEXERS AND FILTERS | WA2BTW | 6 | V2 #2 |
| 1/2 WAVE BANDPASS FILTER | WB5JLZ | 1 | V2 #2 |
| VSB FILTER FOR 1253 MHZ | WA6SVT | 1 | V2 #3 |
| RPT RX ANT FILTER | K7YZZ | 2 | V3 #4 |
| SUPER VSB FILTER | WB5KGL | 2 | V4 #1 |
| SIMPLE 440 QRM FILTER | WB9YAJ | 1 | V5 #1 |
| CORRECTION | KB9FO | 1 | V5 #3 |
| ATV L BAND FILTER (1250 MHZ) | W6OAL | 2 | V5 #4 |
| 1280 MHZ CAVITY FILTER | WA8RMC | 1 | V7 #4 |
| KEEPING COMMERCIAL TV OUT OF ATV | W3WVV | 1 | V8 #3 |
| 70 CM INTERDIGITAL FILTER | ATCO | 1 | V8 #3 |
| BYPASS CAPS (R/C QRM SOLUTION) | OTTO | 1 | V8 #4 |
| 900 MHZ VSB FILTER (E-MAIL DISCUSSION THREAD) | AA2MZ | 2 | V8 #4 |

## FM VIDEO

[NOTE: THERE ARE SEVERAL FM VIDEO DISCUSSIONS AND HELPFUL ITEMS IN THE NEWS CHAT OF E-MAIL IN MANY ISSUES ALSO CHECK THE HATS NEWS ITEMS]

| | | | |
|---|---|---|---|
| 10 MICROHENRY COIL FOR FM PRE-EMPHASIS | GW3MEO | 1 | V2 #2 |
| HETRODYNE FM TRANSMITTER PART 1 | WB0ZJP | 3 | V2 #2 |
| UNDERSTANDING FM SIDEBANDS | JOHNSTON | 1 | V2 #2 |
| A LIMITER FOR FM-TV | DJ7OO | 1 | V2 #2 |
| PRE-EMPHASIS, DE-EMPHASIS FOR FM VIDEO | ZL1ABS | 1 | V2 #4 |
| A SIMPLE 24 CM FM TV TRANSMITTER | VK4XRL | 1 | V5 #1 |
| FM ATV (AM VS FM) | DJ6PI | 8 | V5 #3 |
| FM'S HOLD ON SPECTRAL REAL ESTATE | HOFFNER | 4 | V6 #1 |
| SETTING FM VIDEO DEVIATION | WB9OQM | 3 | V7 #1 |
| CALIBRATE YOUR RECEIVER FOR FM VIDEO | WB9OQM | 3 | V7 #2 |
| TWO BAND WIDEBAND FM RECEIVER | K3AAF | 1 | V8 #2 |
| TO PRE-EMPHASIZE OR NOT | K3AAF | 4 | V8 #3 |
| CHICAGO FM REPEATER (OPERATIONAL) | N9DUA | 1 | V8 #3 |
| 13 CM FM ATV EXCITER | DJ8ES | 5 | V8 #3 |
| 900 MHZ RABBIT FM VIDEO (E-MAIL DISCUSSIONS) | -- | 1 | V8 #3 |
| VIDEO FM PRE-EMPHASIS | WB9OQM | 1 | V8 #4 |
| 900 MHZ FM VIDEO RABBIT RECEIVERS | VE3EKA | 2 | V9 #1 |
| 10 GHZ FM VIDEO RECORD DX | G8PTH | 2 | V9 #3 |
| RABBIT POWER (DIAGRAMS AND FREQUENCY BINARY CODING) | N8PXW | 2 | V9 #3 |

## HDTV

| | | | |
|---|---|---|---|
| HDTV, A COMPLETE INTRODUCTION | KB9FO | 12 | V5 #3 |
| LOW COST HDTV TV SET | ATVQ | 1 | V5 #4 |
| HDTV UPDATE | WEISS | 3 | V6 #1 |
| ZENITH/GOLDSTAR HDTV VCR | ZENITH | 1 | V6 #1 |
| HDTV UPDATE COFDM | KB9FO | 1 | V7 #2 |
| DSS SAT TV | | 1 | V7 #4 |

## HUMOR

| | | | |
|---|---|---|---|
| BLACK HOLE DISPOSAL UNITS | ANNON | 1 | V2 #1 |
| P4 ON EARPHONE JACK ANECDOTE | KB9FO | 1 | V2 #2 |
| METRIC CONVERSIONS | ANON | 1 | V3 #2 |
| NEW TECHNOLOGY, SMD'S | KB9FO | 2 | V3 #2 |
| DO NOT TWEAK WARNING LABEL | ANON | 1 | V3 #3 |
| READING BETWEEN THE LINES | TITUS | 1 | V4 #1 |
| LIGHTER SIDE OF A BALLOON LAUNCH | KB9BSV | 1 | V5 #1 |
| BRITISH CHANGE TO NTSC | KB9FO | 2 | V6 #2 |
| SCHOLASTIC APOSTASY TERGIVERSATION VALUTUDINARIAN(SETI) | KB9FO | 2 | V6 #2 |
| THE ADVENTURES OF THE MASKED RADIO OPERATOR | KB9FO | 2 | V6 #2 |
| YOUR GETTING OLD WHEN | W9NBG | 1 | V7 #2 |
| COMMERCIALS WE WOULD LOVE TO SEE (IN BAD TASTE) | KB9FO | 1 | V7 #4 |
| WORDS OF WARNING (USED EQUIPMENT) | G8PTH | 1 | V7 #4 |
| A GIRL'S GUIDE TO GEEK GUYS | WS1O | 2 | V8 #4 |
| HAMS'S PROTECT WORLD FROM INVASION | KB9FO | 2 | V8 #4 |

## NEWS (SHORT ITEMS)

| | | | |
|---|---|---|---|
| NATIONAL ATV LINKUP VIA SATELLITE | N6GOZ | 1 | V2 #3 |
| DAYTON 1989 | KB9FO | 2 | V2 #3 |
| PLAN FOR NET OPERATIONS | W3HMS | 1 | V2 #3 |
| LIFE AFTER DAYTON AND BATC WEEKEND | KB9FO | 6 | V2 #3 |
| R/C ATV | KA9CAP | 1 | V3 #1 |
| G8PTH SEEKS TEST PATTERNS | G8PTH | 1 | V3 #1 |
| BILL WB8ELK STARTS AS EDITOR OF 73 MAGAZINE | ATVQ | 1 | V3 #2 |
| PACKET ALERT | WB4APR | 1 | V3 #2 |
| COMMERCIAL HAM TV PROGRAM IDEA | KB9FO | 1 | V3 #2 |
| PUBLICITY, BATON ROUGE | WB5JLZ | 1 | V3 #2 |
| OLD TUBES | KB9FO | 1 | V3 #3 |
| TWO WAY TV (NOVEMBER 1940) [HISTORICAL] | RADIO MAG | 1 | V3 #3 |
| ATV SAVES LIVES | WV0J | 1 | V3 #3 |
| READER RESPONSE TO CABLE TV QRM ARTICLE | N0IVN | 1 | V3 #3 |
| LETTER TO ARRL ABOUT LACK OF ATV ARTICLES | WB4APR | 1 | V3 #3 |
| READER LETTERS | VARIOUS | 5 | V3 #3 |
| MORE THAN RADIOS, MAKING OF HAM MOVIE | KB9FO | 2 | V3 #4 |
| READER LETTERS (CLUB NEWS) | VARIOUS | 4 | V3 #4 |
| MORE THAN RADIOS (THE MOVIE) | WWATS | 1 | V4 #1 |
| MBC-TV HAM RADIO NEWS SAT PROGRAM | W0VV | 1 | V4 #1 |
| HF ATV NET | WB8ELK | 1 | V4 #1 |
| AEA'S HAM AMBASSADOR AWARD | AEA | 1 | V4 #1 |
| LISAT MOBILE RELAYS BALLOON VIDEO(DAYTONA, FL) | LISAT | 1 | V4 #1 |
| ANOTHER HAM TV/SAT PROGRAM | WB2YQT | 2 | V4 #1 |
| SATELLITE HAM RADIO PROGRAM UPDATE | KB9FO | 1 | V4 #2 |
| MORE THAN RADIO'S (THE MOVIE) PART II | KB7FHD | 3 | V4 #2 |
| PHOTO HISTORY OF ATV MAGAZINES | KB9FO | 16 | V4 #2 |
| DISABLED DX'ERS | KB7NHZ | 1 | V4 #3 |
| QSO AMATEUR RADIO SATELLITE SHOW UPDATE | ATVQ | 1 | V4 #3 |
| CUMULATIVE INDEX TO VOL 4 #3 | ATVQ | 14 | V4 #3 |
| WEEKLY ATV NET ON SATELLITE RADIO | WB8ELK | 1 | V4 #4 |
| THE RADIO CHANNEL (SAT HAM RADIO PROGRAM) | N0MAL | 1 | V4 #4 |
| NEW AT Q, NEW RF PLANT, KENWOOD SERVICE | KB9FO | 1 | V5 #1 |
| ORDER OF THE IRON TEST PATTERN | ATVQ | 1 | V5 #1 |
| LOCAL INFO LOG FORM | ATVQ | 1 | V5 #1 |
| BILL PASTERNAK COMMENTS ON ATV | WA6ITF | 2 | V5 #1 |
| READER REPLY TO PASTERNAK | KD0LO | 1 | V5 #2 |
| MAKING CONTACT (LIST OF VOICE COORDINATION FREQUENCIES) | ATVQ | 1 | V5 #2 |
| DAYTON 1992 | ATVQ | 1 | V5 #3 |
| RADIO FRIENDS (PROPOSED HAM TV SHOW) | W5YI | 2 | V5 #3 |

# NEWS (SHORT ITEMS)

| | | | |
|---|---|---|---|
| SPECTRUM ANALYZER | W3WVV | 2 | V5 #3 |
| NEW HAM VIDEO, FROM CREATOR OF MORE THAN RADIOS | ATVQ | 1 | V5 #4 |
| DIRECT TO HOME SATELLITE TV | THOMPSON | 1 | V5 #4 |
| TEST EQUIPMENT CATALOG | BEL MERIT | 1 | V5 #4 |
| SILENT KEY GERALD MALSEED W3WVC | | 1 | V5 #4 |
| ARRL NATIONAL CONVENTION | WA6SVT | 1 | V5 #4 |
| TELCO'S EYE TWISTED PAIR (VIDEO DIAL TONE) | TV TECH | 1 | V6 #1 |
| RACE CAR ATV | THEIN | 1 | V6 #1 |
| ANOTHER READER REPLY TO WA6ITF EDITORIAL | WB6ZPN | 1 | V6 #1 |
| ANOTHER READER REPLY TO PASTERNAK WA6ITF | K6CUK | 1 | V6 #1 |
| LETTER ABOUT ATV AND BROADCAST NEWS | NS1E | 1 | V6 #1 |
| LETTER ON T-MARC AND FREQ COORDINATION | N4MWU | 1 | V6 #1 |
| NEW JERSEY BELL TO OFFER CATV | PRESS RELEASE | 2 | V6 #1 |
| LAKE COUNTY HAMFEST | AC4KN | 1 | V6 #2 |
| FOUNDATION FOR AMATEUR RADIO SCHOLARSHIPS | FAR | 1 | V6 #2 |
| ATV STATION ON A BUDGET | K3HKR | 1 | V6 #2 |
| DARA HONORS ATV'ER | ATVQ | 1 | V6 #3 |
| ATV RPT CAN TRANSMIT MUSIC (IN BRITAIN) | CQ-TV | 1 | V6 #3 |
| 1993 SUMMER CES SHOW VIDEO EQUIPMENT | ATVQ | 1 | V6 #3 |
| KC, MO HAMFEST | ATVQ | 1 | V6 #3 |
| MARYSVILLE HAMFEST | ATVQ | 1 | V6 #3 |
| MARION OHIO EQUIPMENT REQUEST | | 1 | V6 #3 |
| DAYTON HAMFEST REVIEW | ATVQ | 2 | V6 #3 |
| QUEST AWARD PROGRAM | ATVQ | 6 | V6 #4 |
| REPRINT V8 #1 | | | |
| LITCHFIELD ATV PARTY ANNOUNCEMENT | K9SM | 1 | V6 #4 |
| HAM SHOWS, VALLEY FORGE REVIEW | KB9FO | 2 | V6 #4 |
| MEDFORD MIDDLE SCHOOL MINI HAM COURSE | N9GHZ | 1 | V6 #4 |
| ANCIENT TV, BOOKS OF NOTE | KB9FO | 1 | V7 #2 |
| ATV IN VIDEOMAKER MAGAZINE | ATVQ | 1 | V7 #2 |
| PHD HAMFEST (KC, MO) | PHD | 1 | V7 #2 |
| NEW VHF BOOKS FROM CQ | CQ | 1 | V7 #3 |
| ATV'ER CHOSEN HAM OF THE YEAR | WT3P | 1 | V7 #3 |
| HOOKED ON COMMERCIAL TV DXING | QA9A | 1 | V7 #3 |
| COMMERCIAL LICENSEE FCC FEES | FCC | 1 | V7 #3 |
| WELCOME TO E-SKIP TV DX | TV-FM DX ASSOC | 2 | V7 #3 |
| DCT DIGITAL COMPRESSION TV | | 2 | V7 #3 |
| SOFTWARE CONVERTS COMPUTER TO SPECTRUM ANALYZER | | 1 | V7 #4 |
| NEW DIRECTIO FOR CALLBOOK | | 1 | V7 #4 |
| OLD THRASHERS REUNION | W0ENR | 1 | V7 #4 |
| WEATHER RADAR IMAGES | K0Z | 1 | V7 #4 |
| MORE HI-CA EFFORTS | W6ORG | 1 | V7 #4 |
| ARRL LIBRARY CONTAINS ATV MOVIES | ARRL | 2 | V8 #1 |
| ARRL RESPONSE LETTER TO ATV INQUIRIES | ARRL | 4 | V8 #1 |
| E-COMM EMERGENCY ARS LINK VIA WWW | | 2 | V8 #1 |
| ATV INTERNET BBS SERVER (ATV@TALLAHASSEE.NET) | | 1 | V8 #1 |
| LEW MCCOY ON ANTENNAS BOOK BY CQ | | 1 | V8 #1 |
| BALUNS AND UNUNS BOOK (BY CQ) | | 1 | V8 #1 |
| CQ'S GETTING STARTED INHAM RADIO VIDEO TAPE | | 1 | V8 #1 |
| GO VIDEO EDITING SOFTWARE | | 1 | V8 #2 |
| VIDEONICS EDIT WUITE | | 1 | V8 #2 |
| LISATS AT DAYTON | | 1 | V8 #3 |
| GORDON WEST WB6NOA BOOKS AND RADIO TELEGRAPH COURSE | | 1 | V8 #3 |
| SPECIAL OLYMPICS ATV | N1GAU | 4 | V8 #3 |
| SPECIAL OLYMPICS ATV | WS1O | 2 | V8 #3 |

| | | | |
|---|---|---|---|
| SPECIAL OLYMPICS ATV | N1GAU | 4 | V8 #3 |
| SPECIAL OLYMPICS ATV | WS1O | 2 | V8 #3 |
| ATV'ER BUILDS FIRST DIGITAL TV NEWS TRUCK | | 1 | V8 #4 |
| FT WAYNE HAMFEST IN REVIEW | KB9FO | 1 | V8 #4 |
| DON STONER W6TNS, NARA ON ATV | W6TNS | 2 | V8 #4 |
| BRIAN BATTLES, QST FEATURE EDITOR ON ATV | WS1O | 4 | V8 #4 |
| FREE ON-LINE HAM MAGAZINE | | 1 | V8 #4 |
| IF YOU ARE ONLY TALKING YOU'RE NOT GETTING THE PICTURE | KB9FO | 2 | V8 #4 |
| STUDENTS REPORT (VIA ATV) ON THEIR WORLD | | 1 | V9 #1 |
| 900 MHZ FM RECEIVERS | | 1 | V9 #1 |
| TRACKING 900 MHZ RADAR | WB6IZG | 1 | V9 #3 |
| A NEW WAY TO ENJOY ATV DXING | W9NTP | 2 | V9 #3 |
| THE REAL CAPTAIN VIDEO | W9NBG | 2 | V9 #4 |
| THE RUMORS STOP HERE, TO BE OR NOT TO BE AN ARRL DIRECTOR | | 2 | V9 #4 |
| THE $70,000 DIGITAL ATV QSO | | 1 | V9 #4 |
| HISTORY OF THE HAMTRONICS ATV RX AND PUBLIC SERVICE | | 2 | V9 #4 |
| WWW PAGES FOR HAMS | | 2 | V9 #4 |
| COMET ATV VERTICLE FOR 23 CM BAND | N8UDK | 1 | V10 #1 |
| WWW ATV AUDIO | WB6IZG | 1 | V10 #1 |
| ATV ALTITUDE RECORD (53 MILES) | W6ORG | 1 | V10 #1 |


# E-MAIL DISCUSSIONS


| | | | |
|---|---|---|---|
| RABBIT QUESTIONS | E-MAIL | 1 | V7 #4 |
| MICROWAVE EQUIPMENT, 3310 PA, ROCHESTER ATV, UK, OK | E-MAIL | 2 | V7 #4 |
| 900 MHZ | E-MAIL | 1 | V8 #1 |
| QUALITY OF RECEPTION, ATV MODULATORS | E-MAIL | 2 | V8 #1 |
| VIDEO-ID | E-MAIL | 1 | V8 #2 |
| NEW 900 MHZ RULES | E-MAIL | 3 | V8 #2 |
| LOOKING FOR SIGNALS, VSB FILTERS, EQUIPMENT, NEW STATIONS, | E-MAIL | 2 | V8 #3 |
| RABBITS, ROBOT 1200, SUPER CIRCUITS POWER PLATE FM ATV TX | E-MAIL | 1 | V8 #3 |
| ATV ID, TWIN CITIES, UNDERWATER ATV, SCROLLING MESSAGES, RABBIT SUPER CIRCUITS, KPA5 POWER ADJUSTMENT, SLOT ANTENNAS HOMEBREW ATV, R/C ANTENNAS, NEW ATV'ER QUESTIONS, VSB FILTERS, TN WWW PAGE | E-MAIL | 5 | V8 #4 |
| S-BAND ANTENNA, NBFM VS ATV, MODE PROBLEMS IN UK, HOMEBREW ANT, 900 MHZ RABBIT, SCROLLING MESSAGES, SPACE SHUTTLE, FCC DATABASE | E-MAIL | 7 | V9 #1 |


# ATV ACTIVITY & CLUB NEWS


| | | | |
|---|---|---|---|
| **ALABAMA** | | | |
| BIRMINGHAM | N4RUC | 1 | V2 #3 |
| MOBILE | N4UXY | 1 | V2 #3 |
| MOBILE | N4RUC | 2 | V3 #4 |
| HUNTSVILLE GROUP | KK4HF | 1 | V3 #3 |
| HUNTSVILLE, TN VALLEY ATV | CLUB | 1 | V3 #3 |
| WETUMPKA | WA4MTG | 1 | V2 #1 |
| MOBILE/PENSACOLA | N4RUC | 1 | V3 #2 |
| **ALASKA** | | | |
| ANCHORAGE HAMFEST | KL7YF | 1 | V4 #3 |
| **ARIZONA** | | | |
| PHOENIX | WB8ELK | 1 | V2 #2 |
| PHOENIX | WB8ELK | 1 | V2 #3 |
| TUCSON | WB8ELK | 1 | V2 #2 |
| TUCSON | WB8ELK | 1 | V2 #3 |
| SCOTTSDALE FARE | KB7LPW | 1 | V7 #3 |
| ARIZONA AMATEURS ON TV | | 1 | V7 #3 |
| **ARKANSAS** | | | |
| LITTLE ROCK HAMFEST | | 1 | V8 #1 |
| **CALIFORNIA** | | | |
| ATN | WA6SVT | 1 | V3 #1 |
| ATN, SANTIAGO | WA6SVT | 1 | V3 #4 |
| ATN RPT LINKING NEWS | WA6SVT | 1 | V5 #4 |
| ATV DAY AT A-TECH STORE | KB9FO | 1 | V2 #1 |

| | | | |
|---|---|---|---|
| ATV AT RONALD REAGAN LIBRARY | W6LUY | 2 | V5 #2 |
| CHICO-PARADISE | W6SYX | 1 | V3 #1 |
| CHICO | W6SYX | 1 | V4 #2 |
| LA/SAN DIEGO | WB8ELK | 1 | V2 #2 |
| HAM TV SIGNERS (SIGN LANGUAGE) LA | WB6ZPN | 1 | V2 #2 |
| GRIFFITH OBSERVATORY ATV | WB6BAP | 1 | V2 #4 |
| MONTEREY | WB8ELK | 1 | V2 #3 |
| MONTEREY | KC3RL | 1 | V2 #1 |
| MONTEREY PUBLIC SERVICE ATV | KC3RL | 3 | V6 #2 |
| MT. DIABLO | W6NKF | 1 | V4 #1 |
| PASADENA ROSE PARADE WORLD COVERAGE | WB6BAP | 1 | V2 #1 |
| PASADENA ROSE PARADE VIDEO TAPE | WB6BAP | 1 | V2 #2 |
| COLOR PHOTO ESSAY OF ROSE PARADE | WB8ELK | 2 | V2 #2 |
| ROSE PARADE SATELLITE LINK | WB8ELK | 2 | V2 #2 |
| ATV AT ROSE PARADE 1990 | KI6VK | 1 | V4 #1 |
| 1991 ROSE PARADE ATV | WA6SVT | 1 | V4 #2 |
| ROSE PARADE 1992 | WA6SVT | 5 | V5 #2 |
| BLACK MOUNTAIN/SACRAMENTO | N6HOS | 1 | V2 #2 |
| SAN JOAQUINE VALLEY | K6YDW | 1 | V3 #1 |
| SAN JOSE/SOUTH BAY | W6JHJ | 1 | V2 #2 |
| SAN JOSE | WB8ELK | 1 | V2 #3 |
| SANTA YNEZ (BUELTON) | K3NXF | 1 | V4 #1 |
| TAHOE CITY | K6YDW | 1 | V3 #4 |
| 10TH ANNIVERSARY PARTY FOR ATN | WA6SVT | 1 | V6 #3 |
| SOUTH BAY ATV EXPANSION | W6JHJ | 1 | V7 #1 |
| VACAVILLE FIESTA DAYS | AB6VI | 2 | V7 #4 |
| **COLORADO** | | | |
| DENVER | N0JBK | 1 | V3 #3 |
| DENVER, WESTERN VISION NETWORK | WVN | 2 | V3 #3 |
| RESCUE ON UNCOMPAHGRE PEAK | KB0CY | 2 | V5 #4 |
| RAMPART NETWORK | RHVN | 1 | V5 #4 |
| HAM RADIO AT THE LIBRARY | WVN | 1 | V6 #2 |
| ZERO CALL CERTIFICATE | WVN | 1 | V7 #2 |
| **CONNECTICUT** | | | |
| BETHEL, | KZ1Z | 1 | V2 #1 |
| NEW HAVEN | N1FHN | 1 | V2 #2 |
| SOAPSTONE MT. | W1HGJ | 1 | V4 #1 |
| W1NRE RPT | W1NRE | 2 | V3 #1 |
| SPECIAL OLYMPICS | WS1O | 1 | V8 #2 |
| **DELAWARE** | | | |
| DELMARVA | N3CUJ | 2 | V4 #3 |
| **FLORIDA** | | | |
| DU BARY | K2AGT | 1 | V3 #1 |
| JACKSONVILLE | N4PTG | 1 | V2 #3 |
| JACKSONVILLE | WA4VHP | 1 | V4 #4 |
| ORLANDO | W4DPM | 1 | V2 #1 |
| ORLANDO | ATVQ | 1 | V3 #1 |
| PERRY FLORIDA FIRE | WB2NGZ | 2 | V5 #3 |
| ST. PETERSBURG | WA4GRK | 1 | V2 #4 |
| LISATS (LAUNCH INFO ATV) CAPE CANAVERAL | LISATS | 1 | V3 #4 |
| LISAT ATV RPT UPDATE | LISAT | 1 | V4 #3 |
| LISAT ATV RPT UPDATE | LISAT | 1 | V5 #1 |
| TAMPA BAY ACTIVITY | N4UYO | 1 | V5 #1 |
| TAMPA BAY | N4UYO | 1 | V5 #2 |
| TREASURE COAST | HAMNET | 1 | V4 #1 |
| TITUSVILLE | K4ZS | 1 | V2 #1 |
| WAYK TV HOSTS LISATS | LISAT | 1 | V4 #1 |
| LISATS CAPE VIDEO | LISAT | 1 | V7 #4 |
| CHRISTMAS PARADE BY LISATS (ALSO RPT AND TOWER) | LISAT | 1 | V8 #1 |
| PORT ST LUCIE APPLIES FOR RPT | K4ATV | 1 | V8 #3 |
| COCOA BEACH PARADE | LISATS | 1 | V8 #3 |

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|---|---|---|---|
| **GEORGIA** | | | |
| SAVANNAH | N4OYT | 1 | V3 #1 |
| SAVANNAH | KD4ODE | 1 | V4 #1 |
| SAVANNAH | WA4VHP | 1 | V4 #3 |
| SAVANNAH HAMFEST | WA4VHP | 1 | V5 #1 |
| SAVANNAH ACTIVITY | WA4VHP | 1 | V5 #3 |
| COASTAL ARS RPT | KA4KOE | 2 | V6 #1 |
| SAVANNAH RPT | KA4KOE | 1 | V8 #2 |
| ATLANTA WEB SITE | | 1 | V8 #3 |
| **HAWAII** | | | |
| PAHOA | KH6HME | 1 | V2 #1 |
| A VISIT TO THE ISLANDS | KB9FO | 2 | V3 #4 |
| KB9FO VISITS HAWAII | KB9FO | 1 | V3 #4 |
| **IDAHO** | | | |
| BOISE | WA7MXN | 1 | V4 #1 |
| **ILLINOIS** | | | |
| CHAMPAIGN-URBANA | WB8ELK | 1 | V2 #2 |
| CHICAGO ATV RPT | NZ9E | 1 | V2 #2 |
| HIGH TECH SANTA | K9SM | 1 | V3 #2 |
| KB9FO 3 BAND MOBILE AND SHACK ANTENNA 1991 | KB9FO | 1 | V4 #4 |
| 6TH ANNUAL DINNER (LITCHFIELD) | K9SM | 1 | V5 #4 |
| 6TH ANNUAL DINNER (RESULTS) | K9SM | 2 | V6 #1 |
| 7TH ANNUAL ATV DINNER PARTY, LITCHFIELD | K9SM | 1 | V7 #2 |
| CENTRAL IL ATV CLUB OLD SETTLERS PARADE | KA9HDZ | 1 | V7 #4 |
| LITCHFIELD 8TH ATV BANQUET | | 1 | V8 #1 |
| CHICAGO FM ATV REPEATER | | 1 | V8 #3 |
| LITCHFIELD ATV BANQUET | | 1 | V9 #2 |
| CHICAGO ATV | PATC | 1 | V9 #3 |
| **INDIANA** | | | |
| EVANSVILLE RPT ANNOUNCEMENT | WB9PLR | 1 | V5 #1 |
| INDY-GREENSBURG | WB8ELK | 1 | V2 #2 |
| INDIANAPOLIS HAMFEST | KB9FO | 1 | V2 #2 |
| INDY 500 FESTIVAL PARADE | W9DUU | 1 | V2 #3 |
| LA PORTE | WA9GKA | 1 | V2 #1 |
| CENTRAL INDIANA ATV CLUB NEWSLETTER ITEMS & CONTEST | W9NTP | 3 | V5 #4 |
| CENTRAL INDIANA ATV CLUB NEWSLETTER | | 1 | V7 #3 |
| FT WAYNE HAMFEST | | 1 | V7 #4 |
| IN ATV CLUB NEWSLETTER | | 1 | V8 #3 |
| **IOWA** | | | |
| DAVENPORT | WB0BIZ | 1 | V3 #1 |
| DAVENPORT | N9ZK | 1 | V3 #2 |
| DES MOINES | WB0OEU | 2 | V3 #2 |
| DAVENPORT, BRATS T HUNT | N9ZK | 1 | V3 #3 |
| DAVENPORT, BIX 7 RUN PUBLIC SERVICE | N9ZK | 1 | V3 #4 |
| **KANSAS** | | | |
| KANSAS CITY | WB8ELK | 1 | V2 #2 |
| WICHITA | WB8ELK | 1 | V2 #2 |
| KANSAS CITY BBS | KCATVG | 1 | V5 #1 |
| **KENTUCKY** | | | |
| LEAVENWORTH ATV GROUP | WA0NKE | 1 | V4 #3 |
| LEXINGTON | WA8FJK | 1 | V3 #2 |
| LOUISVILLE | WB8ELK | 1 | V2 #2 |
| ATV COUNTRY STYLE (ELIZABETHTOWN) | W4BEJ | 1 | V7 #4 |
| **LOUISIANA** | | | |
| BATON ROUGE | KB9FO | 1 | V3 #3 |
| NATIONAL HOT AIR BALLOON FEST, BATON ROUGE | WB5JLZ | 1 | V3 #4 |
| SOUTHERN LOUISIANA UHF TV SOCIETY | WD0GIV/R | 1 | V6 #1 |
| **MAINE** | | | |
| ON THE ROAD WITH ELK | WB8ELK | 1 | V3 #3 |
| YARMOUTH HAMFEST, ATV BALLOON AND DEMO | | | |
| **MASSACHUSETTS** | | | |
| BOSTON | WB8ELK | 1 | V2 #4 |
| BOSTON | KB9FO | 1 | V3 #4 |
| ECAT (MA, CT, VT, NH, ME) | KA1AFE | 1 | V2 #1 |
| ECAT | ECAT | 1 | V4 #1 |
| MEL DUNBRACK W1BHD-TV | W1BHD | 1 | V4 #1 |
| GREENFIELD | KC1RH | 1 | V4 #1 |
| LEYDEN ATV RPT | KC1RH | 1 | V5 #4 |
| TV GUIDE ATV COVERAGE 1952 | W1BHD-TV | 1 | V2 #2 |

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|---|---|---|---|
| **MARYLAND** | | | |
| BALTIMORE ATV REPEATER | WA3DZZ | 2 | V4 #3 |
| BRATS 4TH OF JULY PARADE COVERAGE | BRATS | 1 | V4 #4 |
| BALTIMORE, SUPER CITIES WALKATHON | BRATS | 1 | V5 #3 |
| BALTIMORE ATV REPORT | BRATS | 1 | V5 #4 |
| BALTIMORE FIELD DAY | K3TAZ/W3WCQ | 1 | V5 #4 |
| HAGERSTOWN | | 1 | V9 #3 |
| **MICHIGAN** | | | |
| KENSINGTON CHALLENGE ATV PUBLIC SERVICE EVENT | KD1E | 1 | V4 #1 |
| MANISTIQUE ACTIVITY | WD8IBT | 1 | V6 #2 |
| JACKSON HAMFEST | | 1 | V8 #1 |
| DETROIT ATV REPEATER | N8UDK | 1 | V9 #1 |
| **MINNESOTA** | | | |
| MN ATV NET | WB0YNH | 1 | V4 #1 |
| MINNEAPOLIS | WB0YNH | 1 | V2 #1 |
| MINNEAPOLIS | KB0GL | 1 | V6 #1 |
| OWATONNA | K0GNH | 1 | V2 #2 |
| SOUTH CENTRAL MN | KA0MIV | 1 | V2 #2 |
| VGA CONVERTERS IN USE | KB0GL | 1 | V9 #1 |
| **MISSISSIPPI** | | | |
| GULF COAST AREA ATV FIRST MEETING | N4RUC | 1 | V3 #1 |
| **MISSOURI** | | | |
| FENTON ATV RPT | ANWEILER | 1 | V5 #4 |
| KANSAS CITY | WB8ELK | 1 | V2 #2 |
| KANSAS CITY | WA0NKE | 1 | V4 #1 |
| MOST UNUSUAL ATV'ER, KC, MO | CLUB | 1 | V3 #4 |
| ST LOUIS | KB0WG | 1 | V2 #1 |
| ST. LOUIS | WB8ELK | 1 | V2 #2 |
| ST. LOUIS REPEATER UPDATE | KD0LO | 1 | V4 #4 |
| **MONTANA** | | | |
| BOZEMAN ATV SCHOOL DEMO | KL7JGS | 1 | V5 #2 |
| GREAT FALLS | K7IUI | 1 | V5 #2 |
| HELENA (3 ITEMS) | K7IUI | 1 | V4 #3 |
| EMERGENCY COMMUNICATIONS | | 1 | V6 #1 |
| RACE TO THE SKY DOG SLED RACE ATV | K7IUI | 1 | V6 #1 |
| **NEBRASKA** | | | |
| OMAHA RPT LINKING | | 1 | V9 #3 |
| **NEW HAMPSHIRE** | | | |
| ATOM CLUB FORMS | ATOM | 1 | V7 #2 |
| **NEW JERSEY** | | | |
| BAYONNE | KB2EQQ | 1 | V3 #4 |
| RUMSON | WB2GIT | 1 | V2 #1 |
| TITUSVILLE | W2JKG | 1 | V2 #1 |
| TOMS RIVER | N2HYG | 1 | V3 #2 |
| ATV SCHOOL DEMO | WA2YSW | 1 | V6 #1 |
| **NEW YORK** | | | |
| ALBANY | WB8ELK | 1 | V2 #4 |
| ALBANY | WB8ELK | 1 | V3 #3 |
| BUFFALO | WB8ELK | 1 | V2 #4 |
| LONG ISLAND | WA2GYX | 1 | V2 #2 |
| NEWBERG | WB2WLN | 1 | V2 #4 |
| PETERSBURG | KC2BA | 1 | V3 #1 |
| STATEN ISLAND/BAYONNE | N2EHN | 1 | V3 #2 |
| HAMS WITH CLASS (STUDENT CLASSES) | WA2QYX | 2 | V4 #4 |
| SHORE POINTS RC HAMFEST | | 1 | V8 #1 |
| **NEW YORK** | | | |
| ROCHESTER ATV | WB2EMS | 1 | V7 #4 |
| 900 MHZ IN BUFFALO | W2WHK | 1 | V9 #4 |

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|---|---|---|---|
| **NORTH CAROLINA** | | | |
| MTN TOP ATV DX EFFORT | K4SAO | 1 | V2 #4 |
| CHARLOTTE | W4PPN | 1 | V8 #2 |
| **OREGON** | | | |
| PORTLAND | WA7DRO | 1 | V2 #1 |
| PORTLAND | WA7DRO | 1 | V2 #2 |
| PORTLAND WA7DRO REPEATER | WA7DRO | 5 | V7 #1 |
| SALEM REPEATER | W7LOU | 1 | V9 #1 |
| **OHIO** | | | |
| ATCO FOX HUNT | KA8ZNY | 1 | V2 #1 |
| ATCO PICNIC/TECH FORUM | KB9FO | 1 | V2 #4 |
| CENTERVILLE | WB8UGV | 1 | V2 #1 |
| CINCINNATI | WB8ELK | 1 | V2 #3 |
| DAYTON | WB8ELK | 1 | V2 #3 |
| DAYTON HAMVENTION REVIEW | WB8ELK | 3 | V3 #3 |
| DAYTON ACTIVITY | DARA | 1 | V4 #1 |
| DAYTON ATVQ PARTY 1991 | ATVQ | 5 | V4 #3 |
| FINDLAY | WB8ELK | 1 | V2 #2 |
| MC DONALD | MC CREARY | 1 | V3 #1 |
| WM8P ATV REPEATER | ATCO | 1 | V3 #4 |
| HOSPITAL ATV | W8DMR | 1 | V4 #1 |
| DAYTON ATV PARTY (ATVQ) | ATVQ | 1 | V4 #1 |
| DAYTON FORUM SPEAKER LINE UP | W6ORG | 1 | V4 #2 |
| DAYTON PREVIEW | ATVQ | 1 | V5 #1 |
| ATV SUPPORTS SPACE SIMULATION | W8DMR | 1 | V5 #3 |
| ATCO DEMO AT CARA | W8DMR | 1 | V7 #3 |
| UNION COUNTY HAMFEST | | 1 | V7 #3 |
| COLUMBUS REPEATER PROGRESS | ATCO | 1 | V7 #3 |
| RED WHITE AND BOOM | ATCO | 1 | V9 #3 |
| **PENNSYLVANIA** | | | |
| BETHEL PARK | W3QNI | 1 | V2 #1 |
| ERIE | WB8ELK | 1 | V2 #4 |
| WARMINSTER | KA3KIU | 1 | V2 #1 |
| WILKES-BARRE | KM3E | 1 | V2 #1 |
| YORK HAMFEST/ATV CONFERENCE | KB9FO | 1 | V2 #2 |
| YORK HAMFEST | KB9FO | 1 | V2 #4 |
| YORK ATV CONFERENCE | KB9FO | 2 | V3 #1 |
| YORK ACTIVITY | W3HMS | 1 | V3 #1 |
| YORK HAMFEST | W3HMS | 1 | V4 #3 |
| NEW PA/MD ATV SOCIETY | W3HMS | 1 | V6 #1 |
| PHILLY/YORK/BALTIMORE | W3HMS | 1 | V7 #1 |
| CAATN MEETING | W3HMS | 1 | V7 #3 |
| CAATN | W3HMS | 1 | V7 #4 |
| CAATN ATV SEMINAR | N3EZD | 1 | V8 #2 |
| PITTSBURG ATV RPT | W3NBN | 1 | V8 #2 |
| CAATN QUARTERLY SEMINAR | N3EZD | 1 | V8 #3 |
| **SOUTH CAROLINA** | | | |
| GREENVILLE, ACTIVITY AND DX | ARC | 1 | V3 #3 |
| HARDEEVILLE | KB4ODE | 1 | V4 #1 |
| **SOUTH DAKOTA** | | | |
| SIOUX FALLS | WA0PBL | 1 | V5 #3 |
| SIOUX FALLS ACTIVITY | WA0PBL | 1 | V6 #1 |
| **TENNESSEE** | | | |
| HENDERSONVILLE | KJ4ZQ | 1 | V2 #3 |
| MEMPHIS | WB8ELK | 1 | V2 #3 |
| NASHVILLE | WB8ELK | 1 | V2 #3 |
| NASHVILLE | KJ4ZQ | 1 | V4 #1 |
| NASHVILLE | KJ4ZQ | 1 | V4 #2 |
| MEMFEST | | 1 | V8 #3 |
| KNOXVILLE REPEATERS | | 1 | V9 #1 |

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|---|---|---|---|
| **TEXAS** | | | |
| ABILENE | WB8ELK | 1 | V2 #3 |
| AUSTIN. | WA8PLR | 1 | V3 #2 |
| BRYAN | K5EJL | 1 | V2 #3 |
| DALLAS, REMOTE IMAGE GROUP | DRIG | 1 | V2 #3 |
| DALLAS, ELK ON THE ROAD | WB8ELK | 1 | V2 #3 |
| EL PASO | GROUP | 1 | V3 #3 |
| EUSTUS | KB5CCA | 1 | V2 #4 |
| GALVESTON | W5KJK | 1 | V2 #1 |
| KILGORE | WB8ELK | 1 | V2 #3 |
| ON THE ROAD WITH ELK | WB8ELK | 2 | V3 #3 |
| HATS (HOUSTON REPEATER) | HATS | 1 | V7 #3 |
| HATS KIT PROGRESS | HATS | 1 | V7 #4 |
| HATS BETA TEST TX FOR 23 CM FM VIDEO | HATS | 2 | V8 #2 |
| HATS HAMVENTON ACTIVITIES | HATS | 2 | V8 #3 |
| NTSC TV TECHNOLOGY | NTSC | 1 | V8 #3 |
| WATS (WACO) ROUNTABLE NET | W5TAH | 1 | V9 #3 |
| HATS, TENNACO PUBLIC SERVICE | HATS | 1 | V9 #3 |
| HATS ATV SYMPOSIUM | KB9FO | 6 | V9 #4 |
| WACO WATS | - | 1 | V10 #1 |
| **VERMONT** | | | |
| MILFORD | KA1EUE | 1 | V4 #1 |
| MT. MANSFIELD | N1QG | 1 | V4 #1 |
| VT ATV | K1HGY | 1 | V2 #1 |
| **VIRGINIA** | | | |
| LOVETTSVILLE | WB4FUJ | 1 | V2 #1 |
| METROVISION/WR4AAG WASH | WA9GVK | 1 | V2 #1 |
| ROANOKE | N4JED | 1 | V3 #1 |
| VIENNA | WD4O | 1 | V2 #1 |
| **WASHINGTON** | | | |
| ATVER ON TV NEWS (KOMO) | W7SRZ | 1 | V2 #1 |
| WEST. WASH. VIDEO TAPE PROGRAM | W7SRZ | 1 | V2 #1 |
| VANCOUVER | WWATS | 1 | V2 #2 |
| YAKIMA | WWATS | 1 | V2 #2 |
| WWATS | WWATS | 1 | V2 #4 |
| SEATTLE ATVQ VISIT AEA/WWATS | KB9FO | 3 | V3 #4 |
| NARA | NARA | 1 | V4 #1 |
| **WEST VIRGINIA** | | | |
| ATV TALK AT HAMFEST | WA4GSS | 1 | V7 #4 |
| **WISCONSIN** | | | |
| WEBSTER | N0EDV | 1 | V3 #2 |
| WAUSAU DREAM FLIGHT (SPACE SIMULATION) | AD9W | 9 | V6 #1 |
| **CANADA** | | | |
| VANCOUVER, BC | VE7AII | 1 | V2 #2 |
| PENTICTON, BC | VE7BEE | 1 | V2 #2 |
| PENTICTON, BC | VE7BEE | 1 | V3 #1 |
| **DX** | | | |
| AUSTRALIA ATV | JURISINIC | 1 | V2 #3 |
| ENGLAND: G8PTH WANTS TV TEST SLIDE ID'S | G8PTH | 1 | V2 #2 |
| BATC CONVENTION 1989 | BATC | 1 | V2 #2 |
| SEVERNSIDE ATV CLUB | G6IQM | 1 | V3 #1 |
| WORLD ATV DX RECORDS | WB8ELK | 1 | V3 #1 |
| BATC 90 REPORT | W4PPN | 2 | V4 #1 |
| FRANCE FORMS ATV GROUP "ANTA" | | 1 | V8 #3 |
| **ATV REPEATERS** | | | |
| DEERFIELD, NH | WA1HZK | 1 | V2 #1 |
| ANNAPOLIS, MD | WB4APR | 1 | V2 #1 |
| AUSTIN, TX "GETTING THE BUGS OUT" | W5VDS | 1 | V2 #2 |
| MT. WILSON, CA RPT AND NET | K6KMN | 1 | V2 #2 |
| MT. WILSON ATV RPT | K6KMN | 1 | V2 #3 |

| | | | |
|---|---|---|---|
| CLEAR LAKE, CA RPT | W6LOU | 1 | V2 #2 |
| EASTERN LONG ISLAND RPT | WA2GYX | 1 | V2 #2 |
| PORTLAND, OR RPT | WWATS | 1 | V2 #2 |
| PENTICTON, BC | VE7BEE | 2 | V2 #2 |
| HONOLULU, HI RPT | AH6IO | 1 | V2 #2 |
| BATON ROUGE, LA RPT | WB5JLZ | 1 | V2 #2 |
| SAN JOSE, BLACK MOUNTAIN | W6JHJ | 1 | V2 #3 |
| DALLAS, REMOTE IMAGE GROUP | DRIG | 1 | V2 #3 |
| KILGORE, TX | WB8ELK | 1 | V2 #3 |
| MONTROSE, PA | KM3E | 1 | V2 #3 |
| DENVER, CO | N0IVN | 1 | V2 #3 |
| LONDON, ONT | VE3TVL | 1 | V2 #4 |
| DAVENPORT, IA | BRATS | 1 | V2 #4 |
| WWATS (SEATTLE) | W7SRZ | 1 | V2 #4 |
| PETERSBURG, NY | KC2BA | 1 | V3 #1 |
| PITTSBURGH, PA | W3KWH | 1 | V3 #1 |
| YOUNGSTOWN/WARREN, OH | N8EWV | 1 | V3 #1 |
| BATON ROUGE, LA | WB5JLZ | 1 | V3 #1 |
| ATN (CA) | WA6SVT | 2 | V3 #2 |
| YORK PA ATV RPT | WA3USG | 1 | V3 #2 |
| TYLER/KILGORE, TX | K5KFC | 1 | V3 #2 |
| EUSTUS, TX | W5KPZ | 1 | V3 #2 |
| NORTH TEXAS | N.T.S.C. | 1 | V3 #4 |
| ST. LOUIS ATV RPT | KD0LO | 1 | V4 #1 |
| K6KMN RPT NEWS | K6KMN | 1 | V4 #1 |
| BALTIMORE ATV REPEATER SYSTEM | WA3DZZ | 2 | V4 #3 |
| K3NXF REPEATER | K3NXF | 3 | V4 #3 |
| FULL DUPLEX REPEATER | BRUNNINGA | 2 | V4 #4 |
| OTTAWA, CANADA RPT | VE3EKA | 2 | V5 #2 |
| NEW PA ATV RPT PITTSBURG AREA | K3HKR | 1 | V6 #1 |
| ATCO REPEATER UPDATE | W8DMR | 1 | V7 #1 |
| CHICAGO ATV REPEATER NEWS | ATVQ | 1 | V7 #1 |
| HOUSTON HATS ATV RPT | HATS | 1 | V7 #1 |
| SAVANNAH, GA ATV RPT | KA4KOE | 1 | V7 #1 |
| TAMPA, FL ATV NET | KD4DLA | 1 | V7 #1 |
| PORTLAND, OR | WA7DRO | 2 | V7 #1 |
| ATN, CA | WA6SVT | 1 | V7 #2 |
| CHICAGO | KB9FO | 1 | V7 #2 |
| VINE GROVE, KY | LTARC | 1 | V7 #2 |
| ATCO REPEATER SYSTEM AMAZING RESULTS | ATCO | 4 | V7 #2 |
| NEW ATV REPEATER SERVES WV/OH/KY | WA4GSS | 1 | V7 #3 |
| ZL LAND REPEATER | ZL1ABS | 1 | V7 #3 |
| KY ATV REPEATER | K4VXP | 1 | V7 #3 |
| DERRY, NH | WB4HFN | 1 | V7 #3 |
| VALLEYVISION (SAN JOAQUIN) | W6YEP | 1 | V7 #4 |
| ARKANSAS ATV REPEATER | N5RAXC | 1 | V7 #4 |
| ATCO (OHIO) NEWSLETTER | ATCO | 3 | V7 #4 |
| BUILDING AN ATV REPEATER | KB9FO | 2 | V8 #2 |
| ARKANSAS REPEATER EFFORT | K5YWL | 5 | V9 #2 |
| K3NXG REPEATER ON-LINE | N6VMO | 1 | V9 #2 |
| SAN LOUIS OBISPO | KD6DSI | 1 | V9 #3 |
| SANTIAGO NEWS | WA6SVT | 2 | V9 #3 |
| PALOMAR MTN | KC6UQH | 1 | V9 #3 |
| BRECKENRIDGE REPEATER | WQ6I | 1 | V9 #3 |
| BALTIMORE-YORK LINK PROJECT | N3EZD | 2 | V9 #3 |
| ATV ABOVE 70 CM, CHALLENGE YOUR STATION | WA8RUT | 3 | V9 #4 |

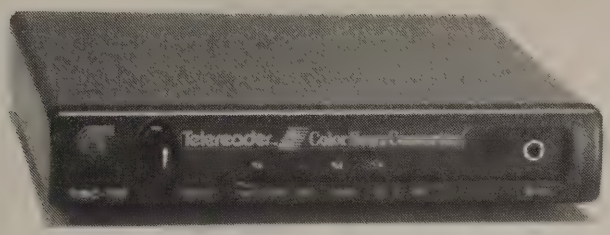
**DX REPORTS**

| | | | |
|---|---|---|---|
| OHIO-IOWA | WA8SAJ | 1 | V2 #1 |
| MD-VA | W3DFS | 1 | V2 #1 |
| CT-VA | KJ4D | 1 | V2 #1 |
| TX-FL | W5VDS | 1 | V2 #1 |
| BAND OPENINGS | VARIOUS | 1 | V4 #1 |
| OHIO | WB8ELK | 1 | V4 #1 |
| THANKSGIVING BAND OPENING | W9NTP | 1 | V4 #1 |
| HAWAII ATV DX BEACON | WB6NOA | 2 | V4 #3 |
| HAWAII TO CALIFORNIA SYNC BUZZ | W6ORG | 1 | V5 #4 |
| QUEST AWARD PROGRAM | ATVQ | 6 | V6 #4 |
| QUEST AWARD MORE INFO | ATVQ | 2 | V7 #1 |
| QUEST CONTEST DATES | ATVQ | 1 | V7 #1,2 |
| CALIFORNIA-HAWAII ATV DX (COLOR PIX TOO) (WATER DX RECORD | | 2 | V7 #3 |
| 225 MILE LOCAL QSO (OHIO) | W8DMR | 1 | V7 #4 |
| 2 METER RECORD BROKEN | WB6NOA | 1 | V7 #4 |
| CQ DX FOG (OHIO/MIDWEST) (NEW LAND DX RECORD) | K8AEH | 4 | V8 #1 |
| NEW US 10 GHZ ATV DX RECORD | | 1 | V9 #3 |
| NEW 10 GHZ FM VIDEO DX RECORD (FRANCE/SPAIN/CORSICA) | G8OZP | 2 | V9 #3 |
| DX RECORDS AND HATS SYMPOSIUM | KB9FO | 6 | V9 #4 |

**EQUIPMENT**

| | | | |
|---|---|---|---|
| AEA ATV TRANSCEIVER | N0IVN | 1 | V2 #2 |
| WINTER CES SHOW (LAS VEGAS) 1989 | WB8ELK | 2 | V2 #2 |
| NEW BROADCAST MUSEUM, IRVING, TX | | 1 | V2 #3 |
| MINIATURE TV CAMERAS | WB8ELK | 1 | V2 #3 |
| SUMMER CES 1989 | WB8ELK | 1 | V2 #3 |
| NEW ATV EQUIPMENT | KB9FO | 1 | V3 #2 |
| NEW AEA ATV FS430A | KB9FO | 2 | V3 #3 |
| YAESU FRG 9600 | WA0NKE | 1 | V3 #3 |
| HEMT TRANSISTORS | ANON | 1 | V3 #4 |
| AEA PREAMP | GRIFFIN | 1 | V4 #1 |
| AMPIRE GASFET PREAMP | WESTLINK | 1 | V4 #1 |
| ULTIMATE WX SAT RX ICS ELECTRONICS | ICSE | 1 | V4 #1 |
| 1691 WX SAT RECEIVER | SPECTRUM INTL | 1 | V4 #2 |
| NEW OMNI STICK | RF PARTS | 1 | V4 #2 |
| HAM STUFF CATALOG | HAM STUFF | 1 | V4 #3 |
| SUMMER CES VIDEO EQUIPMENT | KB9FO | 1 | V5 #1 |
| KENWOOD RZ-1 FOR ATV | N0LGN | 1 | V5 #1 |
| SUMMER CES VIDEO EQUIPMENT | KB9FO | 2 | V5 #3 |
| REVIEW OF ATV WORLD ATV EQUIPMENT | NT7L | 1 | V5 #4 |
| TECH REVIEW OF ATV WORLD ATV TRANSCEIVER | WA6SVT | 1 | V5 #4 |
| PEAK DETECTOR FOR SWR METERS | KF8AT | 1 | V5 #4 |
| NEW RAMSEY KIT CATALOGUE | RAMSEY | 1 | V6 #1 |
| KAM PACTOR | KAM | 1 | V6 #2 |
| HAM LINK | ARE | 4 | V6 #2 |
| BESTLINK-TD SYSTEMS QUITS | ATVQ | 1 | V6 #3 |
| FM ATV RECEIVERS | HF TECHNOLOGY | 1 | V6 #3 |
| ATV'ER ON 6 METERS | QRP | 1 | V6 #3 |
| AERO TRAC ATV ANTENNA | ATVQ | 1 | V6 #3 |
| NEW POWER AMPS FROM HI-SPEC | ATVQ | 1 | V6 #3 |
| PAULDON 50 WATT ATV TRANSCEIVER | ATVQ | 1 | V6 #3 |
| SURPLUS ELECTRONIC SOURCES | ZERO-BEAT | 1 | V6 #3 |
| NEW TECH NEWSLETTER | HART | 1 | V6 #3 |
| AEA GRAPHIC ANTENNA ANALYZER | AEA | 1 | V6 #3 |
| NEW MICRO CAMERAS | MVP | 1 | V6 #3 |
| MOST POWERFUL TV TRANSMITTER | ATVQ | 1 | V6 #3 |
| INCREDIBLE MONEY MACHINE II | LANCASTER | 1 | V6 #3 |

# NEW FROM WYMAN RESEARCH INC.



**Model TSC-70**

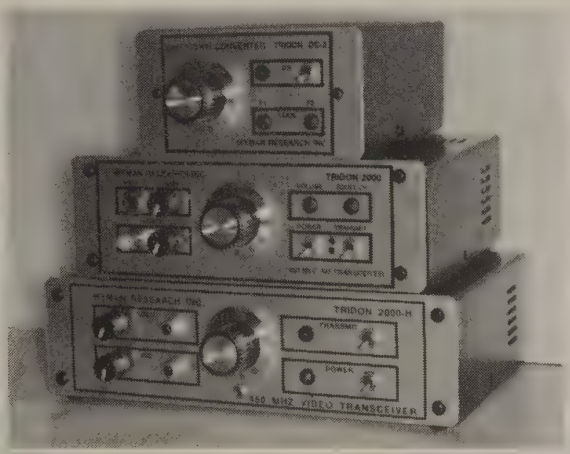
Join the ATV DX Groups who are sending live pictures simultaneously with their fast scan television transmissions. Live SSTV images can be transmitted as audio on your "subcarrier" or the "on carrier" channel. Results are phenomenal. When DX FSTV Images are barely P1, the SSTV image is P5 (1000 times better). This is all possible with the new TASCO TSC-70 shown above. The small 6" x 6" x 1" size makes it possible to instantly connect to your existing ATV equipment without adding computers or frame grabbers as some SSTV systems require.

Call for the latest prices on the TSC-70. You can be assured it costs less than your 10 watt ATV transceiver.

**DC-2** **$109.95**

**TRIDON 2000** **$329.95**

**TRIDON 2000H** **$459.95**




THE TRIDON 2000H HAS ALL THE FEATURES OF THE TRIDON 2000 WITH MORE FEATURES SUCH AS:

*15 WATTS PEAK POWER (ADJUSTABLE)

*LINE AND MIKE AUDIO INPUTS

*N TYPE ANTENNA CONNECTOR

*BUILT IN LINE SAMPLER

*BIG HEAT SINK

*CAMERA MONITOR OUTPUT

WRITE OR CALL FOR A CATALOG DESCRIBING EQUIPMENT THAT WILL PUT YOU ON ATV AT MINIMUM COST. OUR TRANSMITERS AND TRANSCEIVERS ARE THE MOST POWERFUL AND ECONOMICAL SOLD.

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| | | | |
|---|---|---|---|
| NEW ATV EQUIPMENT | ATV WORLD | 1 | V6 #3 |
| REVIEW OF PARABOLIC 24 CM EQUIPMENT | WA6SVT | 2 | V6 #3 |
| AEA QUITS ATV | AEA | 1 | V6 #4 |
| RADIO SCAN MAGAZINE QUITS | RADIO SCAN | 1 | V6 #4 |
| VIDEONICS TITLEMAKER REVIEW | KR0L | 1 | V7 #4 |
| AGE OF RFC 4-110 AMP | W6ORG | 1 | V9 #2 |
| GUNNPLEXER REFERENCES | W6ORG | 1 | V9 #4 |
| **FCC/RULES/BANDPLANS/FREQUENCY COORDINATIONS** | | | |
| DOCKET 90-55 (CODELESS TECH) | FCC | 3 | V3 #2 |
| 23 CM FM ATV FREQ COORDINATION | W6ORG | 1 | V4 #1 |
| NE FREQUENCY COORDINATION | W1NRE | 1 | V4 #2 |
| FCC REQUIRED NASA LETTER TO RETRANSMIT SHUTTLE | NASA | 1 | V4 #4 |
| 900 MHZ BAND PLAN CHANGE PROPOSAL | BRUNINGA | 1 | V4 #4 |
| 444.05 PACKET VS 434 ATV | SO CAL | 1 | V4 #4 |
| FCC PROPOSES "BUSINESS" RULES 97.113 | FCC | 1 | V5 #1 |
| TMARC BAND PLAN (MULTI BANDS) | TMARC | 2 | V5 #1 |
| KB9FO COMMENTS ON 97.133 RULES CHANGE | KB9FO | 3 | V5 #1 |
| GOOD AMATEUR PRACTICE (COMMENTS ON FREQ. COOR) | KB9FO/WB0CMC | 2 | V5 #2 |
| FCC DOCKET 92-136 97.115 (BUSINESS COMMUNICATIONS) | FCC | 3 | V5 #3 |
| COMMENTS ON 440 BAND PLAN /AMSAT | WD0E | 2 | V5 #3 |
| NEW FCC LICENSE FORM (610) | FCC | 1 | V5 #3 |
| COMMENTS ON FCC RULES PROPOSAL | W6ORG | 1 | V5 #4 |
| SPECTRUM PROTECTION ACT | ARRL | 1 | V5 #4 |
| 2 LETTERS ABOUT FREQUENCY COORDINATION | | 2 | V6 #1 |
| FCC NOTICE RM 7869, 73.115 BUSINESS COMMUNICATIONS | FCC | 1 | V6 #1 |
| ARRL SPECTRUM MANAGEMENT COMMITTEE MEETING | ARRL | 1 | V6 #2 |
| FREQUENCY COORDINATION | SERA | 1 | V6 #2 |
| INDIANA REPEATER COUNCIL ATV NEWS | IRC | 1 | V7 #1 |
| 900 MHZ ARRL BANDPLAN | ARRL | 1 | V7 #2 |
| PORTION OF 2.3 GHZ TO BE LOST, FCC | WESTLINK | 2 | V7 #2 |
| INDIANA REPEATER COUNCIL BANDPLAN | IRC | 2 | V7 #3 |
| COMMENTS ON PRB-1 VOICE OF HAM REASON | | 2 | V7 #3 |
| NEW FCC CUSTOMER SERVICE PHONE NUMBER | FCC | 1 | V7 #4 |
| FCC LETTER SUPPORTING HAM ANTENNAS FROM RALPH HALLER | FCC | 1 | V8 #1 |
| AMATEUR PRIMARY ON 2390-2417 MHZ | WA6SVT | 3 | V8 #2 |
| NEW 900 MHZ RULES | FCC | 3 | V8 #2 |
| BIG MACC ATTACK | KB9FO | 14 | V8 #3 |
| BIG ST LOUIS MEETING (BOM) | KB9FO | 3 | V8 #4 |
| ATV/NBFM SPECTRUM MANAGEMENT | KB9FO | 4 | V9 #1 |
| TECHNICAL CONSIDERATIONS FOR FSTV ON 70 CM | W9NRE | 7 | V9 #2 |
| MACC SPEAK (REMOVAL OF ATV FROM 70 CM) | WB0CJX | 1 | V9 #2 |
| WYOMING ATV RPT EFFORTS | N7ZEF | 2 | V9 #2 |
| FT MYERS FL RPT EFFORT | | 1 | V9 #3 |
| MACC SPEAK, MACC TO "ACTIVLY DISCOURAGE ATV" | WD9GIG | 1 | V9 #3 |
| NTSC (NORTH TEXAS) PROPOSED BAND PLANS | NTSC | 13 | V10 #1 |
| **SPACE/BALLOON** | | | |
| HELIUM BALLOON PROJECT (THE FIRST FOUR!) | WB8ELK | 4 | V2 #1 |
| HESPERIA, CA BALLOON LIVE VIDEO CAMERA | WB8ELK | 3 | V2 #2 |
| HIGH FLYING ADVENTURE, MULTIPLE ATV BALLOONS | WB8ELK | 1 | V2 #3 |
| GO FLY A KITE (ATV) | WM8W | 1 | V2 #3 |
| ATV COVERS SHUTTLE LANDING | ATN | 1 | V2 #3 |
| MODEL ROCKET ATV | N8IYD | 1 | V2 #3 |
| NEPTUNE VIDEO TAPE | KB9FO | 1 | V2 #4 |
| OAK RIDGE TN BALLOON "PARAKEET" | WB8ELK | 1 | V2 #4 |
| NEIL ARMSTRONG MUSEUM BALLOON (ONE SMALL STEP..) | WB8ELK | 2 | V2 #4 |
| CHAMPAIGN, IL BALLOON FLIGHT | KA9SZX | 2 | V2 #4 |
| WEBERSAT | WB8ELK | 5 | V3 #1 |
| MICRO-BALLOON, STYROSAT 1, OCT 28 | WB8ELK | 2 | V3 #1 |
| INDEPENDENCE, MO FEB 3 | KD0FW | 1 | V3 #1 |
| WEBERSAT UPDATE | WB8ELK | 1 | V3 #2 |

| | | | |
|---|---|---|---|
| BALLOON LAUNCH SCHEDULE | WB8ELK | 1 | V3 #2 |
| KD0FW BALLOON OVER KS | KD0FW | 3 | V3 #2 |
| TO ACQUIRE A BALLOON (FOX HUNT) | W6OAL | 1 | V3 #2 |
| RECEIVING SPACE SHUTTLE VIDEO | W6ORG | 2 | V3 #3 |
| TEACHERS USING SAREX | NARA | 2 | V3 #3 |
| BALLOON TX RANGE PREDICTION | W6OAL | 1 | V3 #3 |
| FLORIDA BALLOON EFFORT | DBARA | 2 | V3 #3 |
| WEBERSAT SOFTWARE | AMSAT | 1 | V3 #4 |
| CHAMPAIGN, IL BALLOON (DRIFTER 1) | LUTZ | 1 | V3 #4 |
| WEBERSAT UPDATE | WB8ELK | 1 | V3 #4 |
| SKY BEACON 2, CHARLOTTE, NC | KB4T | 2 | V3 #4 |
| SAREX COLUMBIA DEC 2, 1990 | KC4CLD | 3 | V4 #1 |
| SAREX UPDATE | W5DID | 1 | V4 #1 |
| SAREX WG, ROY NEAL | K6DUE | 1 | V4 #1 |
| NASA USES K4GCC FOR VIEWING SITE | K4GCC | 1 | V4 #1 |
| CROSS COUNTRY BALLOON | WB8ELK | 1 | V4 #1 |
| NORTH CAROLINA LIVE CAMERA BALLOON | WB8ELK | 2 | V4 #1 |
| STS-37 FSTV TO SPACE SHUTTLE | NASA/ATVQ | 5 | V4 #2 |
| PROJECT EXCELSUS, ATV ROCKET | WB8ELK | 2 | V4 #2 |
| BALLOON LAUNCH SCHEDULE | WB8ELK | 2 | V4 #2 |
| DARA (DAYTON) BALLOON LAUNCH | DARA | 1 | V4 #2 |
| STS-37 AUTHORIZED STATIONS | ARRL | 1 | V4 #2 |
| GO FLY A KITE | N8EWV | 2 | V4 #2 |
| STS-37 SUCCESS STORY | ATVQ | 6 | V4 #3 |
| KC6A'S STS 37 STATION | W6ORG | 2 | V4 #3 |
| HUNTSVILLE WA4NZD STS-37 STATION | HUNTSVILLE ARC | 3 | V4 #3 |
| ROCKOON UPDATE (ROCKER/BALLOON) | KB4N | 1 | V4 #3 |
| EDGE OF SPACE SCIENCES (DENVER) BALLOONS | WB0TUB | 3 | V4 #3 |
| DARA BALLOON | AH2AR | 1 | V4 #3 |
| FRANKLIN HS ATV BALLOON | WB8ELK | 3 | V4 #3 |
| EARTHWINDS AROUND-WORLD FLIGHT | WB8ELK | 1 | V4 #4 |
| ROCKOON FLIGHT UPDATE | WB8ELK | 1 | V4 #4 |
| BLT TO THE EDGE OF SPACE (TEXAS ATV BALLOON) | WA5ZIB | 4 | V4 #4 |
| US NAVEL ACADEMY ATV BALLOON | ATVQ | 1 | V4 #4 |
| TIPS FOR SUCCESSFUL ATV BALLOON LAUNCH | AH2AR | 1 | V4 #4 |
| ARE YOU IN ORBIT? | ATVQ | 1 | V5 #1 |
| ATV ON AUSSET | ZL1UJK | 1 | V5 #1 |
| FRANKLIN HS SEND UP ANOTHER ATV BALLOON | WB8ELK | 2 | V5 #1 |
| BALLOON LAUNCH ON 73 BBS | WB8ELK | 1 | V5 #2 |
| EARTHWINDS DELAYED | WB8ELK | 1 | V5 #2 |
| PARAPLANE ATV | K3TAZ | 2 | V5 #2 |
| DARA BALLOON | AH2AR | 3 | V5 #2 |
| ECLIPSE BALLOON | WB8ELK | 3 | V5 #2 |
| HAM RADIO RESCUES SHUTTLE MISSION | ARRL | 1 | V5 #4 |
| DARA BALLOON | AH2AR | 2 | V5 #4 |
| LIQUID FUEL ATV ROCKET TO EDGE OF SPACE | KC6CCC | 1 | V5 #4 |
| LIVE FROM EDGE OF SPACE (ROCKET) | N5AVT | 4 | V5 #4 |
| SAREX UPDATE | N9AB | 1 | V5 #4 |
| ULTRALIGHT ATV ACTIVITY | K3TAZ | 1 | V6 #1 |
| FRANKLIN, IN LAUNCHES ANOTHER ATV SCHOOL BALLOON | WB9IHS | 4 | V6 #1 |
| DEER HUNTER FINDS DARA ATV BALLOON | AH2AR | 1 | V6 #1 |
| NAVEL ACADEMY BALLOON | W3ADO | 1 | V6 #1 |
| ANNOUNCEMENT: NATIONAL BALLOON SYMPOSIUM | W6OAL | 1 | V6 #2 |
| HIGH ALTITUDE RECOVERY SYSTEM | AH2AR | 2 | V6 #2 |
| EDGE OF SPACE BALLOON SYMPOSIUM | W6OAL | 3 | V6 #3 |
| ASHLAND, KY ATV BALLOON | WA4GSS | 3 | V6 #3 |
| SHUTTLE COVERAGE | AI4B | 2 | V7 #3 |
| MIR RR0DL | DJ5YM | 2 | V7 #3 |
| NEAR OUTER SPACE TRANSPORT SYSTEM | KJ5MX | 1 | V7 #4 |
| BALLOON LAUNCH SUCCESSFUL | ATCO | 2 | V9 #3 |

# ORGY NOTES

**A REGULAR COLUMN OF TECHNICAL KNOW-HOW, EQUIPMENT REVIEWS, TECH TOPICS AND SAGE ADVICE FROM THE WORLD'S FOREMOST EXPERT ON ATV, TOM W6ORG. GROUPED BY TOPICS IN EACH ISSUE.**

| | | |
|---|---|---|
| D1010 ATV VERSION MODIFICATIONS, SETTING BLANKING (PEDESTAL) WITH AMP, SYNC BUZZ IN AUDIO, LOW AUDIO ON DX, AMPLIFIER INTERMOD GENERATION, VSB AND POWER OUTPUT, INTERFERENCE TO/FROM ATV | 7 | V2 #1 |
| HOW FAR DOES ATV GO?, IF ONE PREAMP IS GOOD, HOW ABOUT 2?, ENOUGH GAIN? INTERFERENCE, STRONG SIGNALS, BEST ANTENNA AND HORIZONTAL OR VERTICAL? SOUND OR VIDEO ONLY RX, QRM FROM 2 METER RIG DUPLEX OPERATION ANTENNA SEPARATION,FULL DUPLEX AUDIO, 100 WATT AMPS FOR ATV, AMPLIFIER HEADROOM FOR AUDIO INTERMOD IN VIDEO AMPS, SEPARATE SOUND TRANSMISSION, FREQUENCY COORDINATION, REPEATER ANTENNAS, COLOR LOSS, BASIC PROGRAM FOR PATH LOSS CALCULATION | 10 | V2 #2 |
| BEST ANTENNAS, HORIZONTAL OMNI'S, ATV SOUND PEAKER, AEA'S NEW ATV RIG, 220 MHZ EFFECTS, FREQUENCY UTILIZATION (421-439.25) , FIELD DAY ATV, VESTIGIAL SIDE BAND, BETTER SOUND ON DX, GETTING RID OF SYNC BUZZ, ATV IN R/C MODELS 35 WATT DOWNEAST POWER MODULE, VIDEO ID TIMER/RELAY | 6 | V2 #3 |
| RF CONCEPTS 100 WATT 450 MHZ AMP, ATV SOUND PEAKER, VOYAGER NEPTUNE FREE VHS TAPE RGB TO COMPOSITE CONVERTER, ATV SPECTRUM, BAREFOOT AND WITH AMP, WITH D-26, VSB FILTERS, EXTENDED-EXPANDED COLLINEAR ANTENNA, MINI CCD CAMERA, ATV REPEATER CONSIDERATIONS (PART 1), DOWNEAST MICROWAVE MAST MOUNTED PREAMP, COUPLING DC TOCOAX. HIGH POWER AMPS, CHANNEL 13 TVI?, 10 GHZ, COMET WATTMETER/VSWR METER CM VS MHZ, MT. BALDY 10,000 FT ATV DX, ROSE PARADE VIDEO, | 9 | V2 #4 |
| 180 WATT TE SYSTEMS AMP, HAMS IN SPACE ATV, HAZ-MAT AND ATV, ATV REPEATERS PART II DOWNEAST MICROWAVE 70 WATT 23 CM AMP, UNIDEN CCD B&W CHEAP CAMERA, AEA'S NEW ATV TRANSCEIVER AND 50 W AMP, PART 15 RULES FOR AVM (900 MHZ), SCRRBA 33 CM BAND PLAN | 6 | V3 #1 |
| RETRANSMIT SHUTTLE VIDEO, STS 37 DATE CHANGE, SAREX, SSTV IN SPACE, ROBOT RESEARCH, TE SYSTEMS 180 WATT AMP, PAULDON 18 WATT 23 CM AMP, VSB TO DSB MOD FOR PC TX PUTTING ON AN ATV REPEATER PART III, SOUTH FLORIDA ACTIVITY, DAYTON FORUM TOPICS | 7 | V3 #2 |
| TE SYSTEMS 180 WATT AMP, CHOKE R/C RX, DIAMOND SX1000 POWER METER, VSB FILTER THINKING ABOUT ATV RPT PART IV, TWO ANT VS DUPLEXER, AVM FORCES 33 CM BAND PLAN CHANGE, 439.25, BEING LOST TO FM?, | 5 | V3 #3 |
| 900 MHZ PART 15 EQUIPMENT (RABBITS), "INNER VIEW" TX/RX (900 MHZ), INTERNATIONAL CRYSTAL VSB FILTER, VSB NOTES, PAULDON RELATIVE POWER METER AND VIDEO SAMPLER, VERTICAL ANTENNA SHOOT OUT RESULTS | 7 | V3 #4 |
| 434 OR 439 LSB?, CUT ID AND COMPUTER VIDEO NOISE, VARIABLE SENSITIVITY FOR VOR, VRC 45 DYNAMIC RANGE IMPROVEMENT, VIDEO LOW PASS FILTER, MODS TO DOWN CONVERTERS FOR LOWER SIDE, | 2 | V5 #1 |
| ALL SEMICONDUCTORS CAN BE RF DETECTORS, TC70-10 DSB, 70 CM FILTER KIT. | 1 | V5 #3 |
| TO DEVIATE OR NOT TO DEVIATE: FM VIDEO PT 1 | 1 | V6 #2 |
| TO DEVIATE OR NOT TO DEVIATE PART 2 | 2 | V6 #3 |
| TO DEVIATE OR NOT TO DEVIATE PART 3 | 2 | V6 #4 |
| TX1300 TRANSMITTER, FM VIDEO | 1 | V7 #1 |

| | | | |
|---|---|---|---|
| 2500 MILE DX RECORD, R/S 33 CM RABBIT, DOWNEAST PREAMP, GREAT CIRCLE CALCULATION PROGRAM, | | 4 | V7 #4 |
| NEW HANDBOOK, $170 COLOR CAMERA, DOWNEAST SPLIT, RABBIT, DAYTON | | 1 | V8 #1 |
| IT'S OK, IT'S UNDER 100 MILLIWATTS | | 2 | V8 #2 |
| DAYTON 96, MIRAGE AMPS, RF CONCEPTS AMP, MR SPOC AND BANDPLANS | | 5 | V8 #4 |
| KREEPIE-PEEPIE POWER, MINI-AMP, NFCC, | | 1 | V9 #1 |
| CONTROL IT, SHIELDED OR SLOT ANTENNA, CAP ATV, FO-22 ANT, 23 CM RPT | | 2 | V9 #2 |
| MINI CIRCUITS, REPEATER DESENSE, HIGH POWER AMP, CH 3 RECEIVER | | 3 | V9 #4 |

# PORTABLE/MOBILE

| | | | |
|---|---|---|---|
| TAKE TO THE ROAD, MOBILE ATV & ANTENNA | WB8ELK | 1 | V2 #1 |
| ATVQ MOBILE ATV ADVENTURES: IL TO FL | KB9FO | 1 | V2 #2 |
| ELECTRONIC COMPASS | WB8ELK | 1 | V2 #2 |
| MOBILE OPERATION (EQUIPMENT EXPERIENCE) | KB9FO | 1 | V2 #4 |
| MOBILE OPERATION ROTOR | WB9KKC | 2 | V3 #1 |
| BUILDING 10 WATT BACKPACK PORTABLE | K6YDW | 3 | V3 #3 |
| HAMCAM VAN STORY | W8BJN | 1 | V3 #4 |
| JAMBOREE ON THE AIR (BOY SCOUTS) | K3TAZ | 2 | V4 #1 |
| LOOKIE-TALKIE | KS8J | 2 | V4 #1 |
| ATV HT | WA6SVT | 1 | V4 #4 |
| EASY MOUNT MOBILE ATV ANTENNA | AH2AR | 1 | V4 #4 |
| ATV COPTER CRASH | W6ORG | 2 | V5 #4 |
| ATV IN AIRCRAFT | W6ORG | 3 | V9 #4 |

# PREAMPS

| | | | |
|---|---|---|---|
| WHY TOWER TOP AMPS IMPROVE RECEPTION | MANN | 5 | V2 #3 |
| SEVERN SIDE 1.3 GHZ PREAMP | SATVG | 1 | V2 #3 |
| 24 CM PREAMP | CQ-TV | 1 | V7 #4 |
| REVIEW OF SSB MAST MOUNTED PREAMPS | KB9FO | 1 | V8 #4 |

# R/C

| | | | |
|---|---|---|---|
| ATV FLIGHT SIMULATOR | K5MWN | 1 | V2 #4 |
| R/C HELICOPTER | KC6CCC | 1 | V3 #2 |
| R/C VIDEO AIRPLANE | MITSCHKE | 3 | V3 #3 |
| R/C FLIGHT SIMULATOR FLYING BOX | K5MWN | 4 | V3 #3 |
| R/C OPERATIONS | KC6CCC | 1 | V3 #3 |
| UNMANNED AERIAL VEHICLE | KA9CAP | 3 | V6 #1 |
| CARL BERRY FLIES FANTRAINER | K6WMN | 1 | V7 #2 |
| SKY EYE | ATOM | 2 | V7 #3 |
| UAV, UNMANNED AERIAL VEHICLE | KA9CAP | 3 | V8 #2 |
| AIRBORNE ATV | K7YZZ | 4 | V9 #1 |
| R/C HOME PAGE ON WWW | K5MWN | 1 | V9 #3 |
| R/C RECEIVER APPLICATIONS | W6ORG | 2 | V9 #3 |
| CHOPPER ATV | E-MAIL | 1 | V9 #3 |
| R/C ATV TRUCK | E-MAIL | 1 | V9 #3 |
| $179 COLOR CAMERA | W6ORG | 1 | V9 #3 |
| ATV TOYS AND THEIR PRACTICAL USES | WB5MBM | 4 | V9 #4 |
| DODO BIRD ATV R/C | W7YZZ | 1 | V9 #4 |

# RECEIVERS/DOWN CONVERTERS

**GENERAL**

| | | | |
|---|---|---|---|
| IMPROVING RECEIVE PERFORMANCE | WA3USG | 1 | V3 #1 |
| TWO SIGNAL ENHANCEMENT EFFECT | W8DMR | 1 | V3 #2 |
| CHEAP TV RECEIVERS FOR ATV | WB4APR | 1 | V3 #2 |
| ATV RECEIVE ALARM | AH2AR/8 | 1 | V3 #3 |
| ATV RECEPTION IMPROVEMENTS | WA6SVT | 2 | V4 #2 |
| CABLE TV CHANNELS TO ATV FREQUENCY GUIDE | K4GCC | 1 | V4 #3 |
| MODIFIED KENWOOD TM 741 FOR THREE BAND ATV | N6TWB | 1 | V6 #3 |
| AN FM-TV RECEIVER | G3YQC | 4 | V6 #3 |
| THOSE LITTLE DB'S | KB9FO | 1 | V6 #4 |
| DISABLING AFT IN QUARTZ TV | AA0EN | 3 | V9 #2 |

| | | | |
|---|---|---|---|
| DISABLING AFT IN QUARTZ TV | AA0EN | 3 | V9 #2 |
| FOX HUNT RECEIVER | W8DMR | 1 | V9 #2 |
| **440 MHZ** | | | |
| TENKAI TV SET CONVERSION FOR ATV RX | WB8ELK | 1 | V2 #1 |
| **900 MHZ** | | | |
| CHEAP 900 RX/TX (RABBITS) | ATVQ | 1 | V4 #2 |
| BUILD A 900/1200 DOWNCONVERTER | KS8J | 4 | V5 #4 |
| VARIABLE TUNED 922 MHZ RX CONVERTER | ZL2TAR | 2 | V6 #2 |
| **1.2 GHZ** | | | |
| 1.3 GHZ CONVERTER (TO UHF TV CHANNEL) | BATC | 8 | V1 #2 |
| 24 CM GASFET CONVERTER | DD9DUK | 3 | V2 #1 |
| 1280 FM ATV RX | ZL1ABS | 3 | V3 #1 |
| 1.27 GHZ FM RECEIVER | W8DMR | 3 | V3 #2 |
| 24 CM PREAMP (SEVERNSIDE PRODUCT) | P5 | 1 | V3 #3 |
| BUILD 900/1200 DOWNCONVERTER | KS8J | 4 | V5 #4 |
| **2.3 GHZ** | | | |
| 13 CM DOWNCOVERTER | W8DMR | 3 | V2 #3 |
| CONVERSION OF MDS RECEIVER FOR 13 CM ATV | WA6SVT | 1 | V2 #3 |
| PHILLIPS TECH 2.3 GHZ RECEIVER | PTE | 1 | V4 #1 |
| **10 GHZ** | | | |
| 10 GHZ FM ATV SYSTEM | KB0XC | 3 | V4 #2 |
| 10 GHZ FOR ATV | G8KUW | 2 | V6 #1 |
| 10 GHZ STRIPLINES AND MICROSTRIP | G8KUW | 1 | V7 #2 |
| **OTHER** | | | |
| FREE SPACE PATH SIGNAL RECEPTION DISTANCE (CHART V-UHF) | EIA | 1 | V2 #1 |
| FOX HUNT DIRECTION FINDER | W9DUU | 2 | V2 #2 |

# REPEATERS

| | | | |
|---|---|---|---|
| VIDEO OPERATED RELAY | PCE | 1 | V1 #2 |
| DAYTONA ATV FREQUENCY COORDINATOR | DBARA | 1 | V2 #1 |
| CALCULATE ERP (COMPUTER PROGRAM) | W8DMR | 1 | V2 #1 |
| ELKTRONICS VIDEO ID GENERATOR | WB8ELK | 4 | V2 #2 |
| VIC 20/C-64 ATV REPEATER CONTROLLER | W1NRE | 4 | V2 #2 |
| VIDEO ID TIMER | WB8ELK | 1 | V2 #2 |
| VIDEO REPEATER LINK SYSTEM | WB4APR | 2 | V2 #2 |
| ATV REPEATER CONTROLLER | KS8J | 7 | V2 #2 |
| REPEATER DESENCE AND CURE | W5KPZ | 3 | V2 #3 |
| VIDEO AGC FOR REPEATER | W4PPN | 2 | V3 #1 |
| UK REPEATER CONTROLLER | G8CJS | 7 | V3 #1 |
| VIDEO ID TIMER USING ELKTRONICS ID'ER | KB9FO | 1 | V3 #1 |
| GB3ZZ ADVANCED RPT CONTROL SYSTEM | GW6BWX/9 | 3 | V3 #2 |
| REPEATING VIDEO, LAYMANS APPROACH | W5KPZ | 2 | V3 #2 |
| RABBIT DOUBLE PLAY | W1NRE | 4 | V3 #2 |
| C-64 I/O PORT EXPANSION | W1NRE | 2 | V3 #3 |
| 8 CHANNEL A/V SWITCHER | W1NRE | 7 | V3 #3 |
| SCARA ATV REPEATER SYSTEM | W1NRE | 3 | V3 #3 |
| DTMF DECODER USING C-64 | W1NRE | 2 | V3 #3 |
| EL-CHEAPO C-64 A/D CONVERTER | W1NRE | 2 | V3 #3 |
| 16 CHANNEL C-64 A/D CONVERTER | W1NRE | 2 | V3 #3 |
| DTMF CONTROLLED VIDEO SWITCH | KD0LO | 2 | V3 #3 |
| WESTERN WASH. ATV RPT | K7YZZ | 3 | V3 #4 |
| REPEATER TIME OUT TIMER | WD5BJW | 1 | V3 #4 |
| CROSS BAND ATV REPEATER KA4GAQ, MIAMI | KA4GAQ | 2 | V4 #1 |
| SIMPLIFIED TOUCH TONE CONTROL | WA0NKE | 2 | V4 #1 |
| PORTA LOOKIE (PORTABLE REPEATER FOR ATV) | WD5BJW | 1 | V4 #4 |
| VIDEO/AUDIO NOISE REDUCTION FILTER | WB0CMC | 1 | V5 #3 |
| MICRO COMPUTER CONCEPTS VS100 CONTROLLER | AH2AR | 2 | V6 #1 |
| ATV CONTROLLER WITH NO MICROPROCESSOR | AA5BY | 1 | V7 #2 |

| | | | |
|---|---|---|---|
| BRATS ATV CONTROLLER INTERFACE PROJECT | N3EZD | 3 | V7 #4 |
| RF SHIELDING BROADCAST ENGINEERING | | 1 | V8 #2 |
| KB7BY ATV REPEATER CONTROLLER | KB7BY | 8 | V8 #2 |
| SYNC DETECTOR PROBLEMS | W3WVV | 2 | V8 #3 |
| VIDEO ID'ER REVISITED | W3WVV | 1 | V8 #3 |
| MOUNTAIN TOP CAMERA | K6ZVA | 3 | V9 #1 |
| REMOTE CAMERA | AA7AU | 3 | V9 #1 |
| 3.3 GHZ LINK | WD5BQN | 1 | V9 #4 |
| DALLAS ATV | | 1 | V9 #4 |

## SSTV

| | | | |
|---|---|---|---|
| COMMODORE AMIGA FOR SSTV/FSTV | KD0LO | 2 | V2 #2 |
| FRAME GRABBER DIGITIZER FOR IBM | N4ABY | 1 | V2 #3 |
| SSTV AND AEA AVT | KD0LO | 3 | V3 #1 |
| CHEAP ATARI ST SSTV | WB2OSZ | 1 | V3 #1 |
| SSTV SOFTWARE | KC4CIQ | 1 | V4 #3 |
| SSTV TODAY | WB2OSZ | 6 | V5 #3 |
| LETTER TO EDITOR ON SSTV/TOASTER/AMIGA | K3HKR | 1 | V6 #1 |
| ROBOT QUITS HAM SSTV MARKET | ROBOT | 1 | V6 #2 |
| SSTV SOFTWARE | HARLAN | 1 | V6 #3 |
| SSTV SOFTWARE | PASOKON | 1 | V6 #3 |
| SSTV SOFTWARE | KB9MC | 4 | V6 #3 |
| SSTV VIA OSCAR SATELLITE | VE6ZL | 1 | V7 #1 |
| PASOKON SSTV | AVS | 1 | V7 #1 |
| RADIOWARE FOR PASOKON | RADIOWARE | 1 | V7 #2 |
| SSTV PROGRAM AVAILABLE | K2GA | 1 | V8 #2 |
| SSTV, HOW IT ALL BEGAN | VY2CM | 1 | V8 #4 |
| EZ SSTV | | 1 | V9 #1 |

## TEST EQUIPMENT

| | | | |
|---|---|---|---|
| POOR MAN'S SPECTRUM ANALYZER | WA2PZO | 6 | V2 #2 |
| CHART, VSWR, OHMS, VIDEO TIME, DB CONVERSION | GENERIC | 2 | V2 #4 |
| POOR MAN'S SPECTRUM ANALYZER | WA2PZO | 6 | V3 #2 |
| SOLID STATE CONVERSION OF TEK 529 WAVEFORM SCOPE | BE MAG | 2 | V3 #2 |
| MARKER/SIGNAL GENERATOR FOR SPECTRUM ANALYZER | WA2PZO | 2 | V3 #3 |
| SWITCHED FILTER KIT FOR SPECTRUM ANALYZER | WA2PZO | 2 | V3 #3 |
| COLOR BAR/GREY SCALE GENERATOR | ZL1UJK | 2 | V3 #3 |
| VIDEO LINE SAMPLER | K7YZZ | 2 | V3 #4 |
| NTSC COLOR BAR GENERATOR YOU CAN BUILD (GOOD ENOUGH TO BE REPUBLISHED IN RADIO ELECTRONICS!) | WB6P | 7 | V3 #4 |
| SUPER SIGNAL SNIFFER | K7YZZ | 1 | V4 #2 |
| UHF SWR BRIDGE | K7YZZ | 2 | V4 #2 |
| EMITTER FOLLOWER | W3WVV | 1 | V5 #3 |
| LINE SAMPLER | W3WVV | 1 | V5 #3 |
| MAST MOUNT PREAMPLIFIERS AND FILTERS | WA8PLR | 1 | V4 #4 |
| SCOPE GRATICULES FOR VIDEO (COPY TO TRANSPARENCY) | KB9FO | 1 | V4 #4 |
| NTSC SYNC SEPARATOR FOR SCOPE TRIGGER | N3EZD | 3 | V5 #4 |
| SIMPLE 10 GHZ FREQUENCY MEASURING DEVICE | G3RFL | 1 | V6 #1 |
| BUILDING A SPECTRUM ANALYZER | W3WVV | 2 | V6 #2 |
| TRUE RF S-METER FOR ATV WITH BETTER DIAGRAM V8 #2 | WB2LTS | 2 | V8 #1 |
| BUILD AN ATV LINE SAMPLER | WA8RMC | 2 | V8 #3 |
| COLOR BAR GENERATOR | W8DMR | 1 | V9 #2 |

# THEORY AND DISCUSSION

| | | | |
|---|---|---|---|
| BACK TO BASICS, OHMS LAW | KB9FO | 1 | V2 #1 |
| BACK TO BASICS, VIDEO SIDEBANDS | KB9FO | 1 | V2 #2 |
| THAT NEW VIDEO CAMERA (PRODUCTION APPLICATIONS) | BOCIAN | 1 | V2 #1 |
| HOME VIDEO TAPE LIBRARY | KB9FO | 1 | V2 #1 |
| SPECTRUM CRUNCH HDTV INTRO | KB9FO | 1 | V2 #1 |
| UNIVERSAL HIGH DEF COMPUTER INTERFACE | N7QM | 1 | V2 #1 |
| TEST AND MEASUREMENT USING STATISTICS (PART 1) | HAYES | 6 | V2 #1 |
| TEST AND MEASUREMENT USING STATISTICS (PART 2) | HAYES | 2 | V2 #3 |
| TV'S RESOLUTION MAZE, FINDING YOUR WAY | ORAZIO | 2 | V2 #2 |
| PREDICTING RANGE SCIENTIFICALLY (FCC METHOD) | KB9FO | 3 | V2 #3 |
| ANTENNA POINTING GUIDE (COMPUTER PROGRAM) | ATVQ | 1 | V3 #2 |
| TEST SIGNALS (AND COLOR TEST CHART | KB9FO | 6 | V3 #2 |
| CABLE TV RFI AND QRM TO ATV (NATURE OF TV SIGNALS) | KB9FO | 11 | V3 #2 |
| TV GHOST FINDER | W1NRE | 1 | V3 #2 |
| VIDEO TAPE RECORDING, TECH FUNDAMENTALS | KB9FO | 4 | V3 #4 |
| 2C39 CAVITIES, THE REAL STORY | W4WSR | 5 | V4 #2 |
| POOR MAN'S SPECTRUM ANALYZER | K7YZZ | 2 | V4 #3 |
| TELEVISION FUNDAMENTALS BASIC TV SYSTEM | KB9FO | 3 | V4 #3 |
| MY WATT METER SAYS | KB9FO | 2 | V4 #4 |
| SIGNAL REPORTING CHART (P-CHART) A NEW VERSION | WB0ZJP | 1 | V4 #4 |
| 8 PAGE PULL OUT "ATV IS FUN AND INEXPENSIVE" | KB9FO | 8 | V4 #4 |
| ATV IS FUN AND INEXPENSIVE, HOW DO I FIND OUT ABOUT ATV? WHAT FREQUENCIES ARE USED?, MOBILE AND PORTABLE OPERATION TRANSMITTING, LOCAL INFORMATION LOG | | | |
| TELEVISION FUNDAMENTALS, WAVEFORM MONITORS (SCOPES) | KB9FO | 4 | V4 #4 |
| ASK THE DOCTOR, ALIGNMENT OF COLOR CAMERA | KB9FO | 1 | V5 #1 |
| THE TRUTH ABOUT VESTIGIAL SIDEBAND AND SPECTRUM USE | KB9FO | 6 | V5 #2 |
| FM ATV (FM VS AM) | DJ6PI | 8 | V5 #3 |
| I AM JOE'S ANTENNA | KB9FO | 2 | V5 #3 |
| FM'S HOLD ON SPECTRAL REAL ESTATE | HOFFNER | 4 | V6 #1 |
| SHOOTING A VIDEO | ZL1TOF | 2 | V6 #1 |
| 10 GHZ FOR ATV | G8KUW | 2 | V6 #1 |
| NICAM DIGITAL STEREO | G8KUW | 1 | V6 #1 |
| RF PATH LOSS AND C/N RATIO (COMPUTER PROGRAM) | W6ORG | 3 | V6 #1 |
| TESTING COAX LINES | KOLBERT | 3 | V6 #1 |
| LIST OF CONSUMER EQUIPMENT MANUFACTURERS FOR RFI/TVI | ATVQ | 1 | V6 #1 |
| RF POWER MEASUREMENT | W3DL | 1 | V6 #2 |
| EVERYTHING YOU NEED TO KNOW ABOUT PAL | HOFFNER | 3 | V6 #2 |
| 10 GHZ OPERATION | G3RFL | 2 | V6 #4 |
| SETTING FM VIDEO DEVIATION | WB9OQM | 3 | V7 #1 |
| 10 GHZ MICROSTRIP AND STRIPLINE | P5 | 1 | V7 #2 |
| SO YOU WANT TO BUILD AN ATV REPEATER? (FIRST OF SERIES) | WA6SVT | 2 | V7 #2 |
| CHARTS OF CABLE TV AND BROADCAST TV FREQUENCIES (INTL) | KB9FO | 3 | V7 #2 |
| THE DB | W6OAL | 2 | V7 #3 |
| SO YOU WANT TO BUILD A REPEATER (SECOND IN SERIES) | WA6SVT | 4 | V7 #3 |
| SO YOU WANT TO BUILD A REPEATER (THIRD IN SERIES) | WA6SVT | 2 | V7 #4 |
| SAGE ADVICE FOR STARTING OUT ON ATV | W6ORG | 1 | V7 #4 |
| A BASIC STATION | KB9FO | 2 | V7 #4 |
| SO YOU WANT TO BUILD A REPEATER (PART FOUR OF SERIES) | WA6SVT | 1 | V8 #2 |
| FOX HUNTING TIPS | WA4KDO | 1 | V8 #3 |
| ATV BANDWIDTH | W6ORG | 1 | V9 #1 |
| RELATING NOISE FIGURE TO NOISE TEMPERATURE | W8DMR | 1 | V9 #2 |
| THINKING ABOUT PUTTING UP AN ATV REPEATER? | W6ORG | 11 | V9 #3 |
| RF POWER MEASUREMENT | FRED BAUMGARTNER | 3 | V9 #3 |
| THE RIGHT WAY TO HOOK UP YOUR VIDEO SOURCES | W9NBG | 6 | V9 #4 |
| THE NATURE OF VIDEO, MODULATION CONSIDERATIONS | KB9FO | 8 | V9 #4 |
| RF SAFETY | K0NM | 1 | V9 #4 |

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# TRANSMITTERS

## GENERAL

| | | | |
|---|---|---|---|
| HIGH LEVEL MODULATOR FOR ATV | W8DMR | 4 | V9 #2 |
| RF IC'S FOR 1.8 TO 2.5 GHZ | | 1 | V9 #2 |
| GUNNPLEXER VIDEO MODULATOR | W6ORG | 1 | V9 $3 |

## 2 METERS

| | | | |
|---|---|---|---|
| 10 MW BEACON TRANSMITTER | WA4ADG | 1 | V2 #3 |

## 440 MHZ

| | | | |
|---|---|---|---|
| A MODULAR ATV TRANSMITTER | DJ4LB | 9 | V1 #1 |
| HETRODYNE FM TRANSMITTER | WB0ZJP | 3 | V2 #2 |
| A SIMPLE, AND CHEAP LOOKIE TALKIE | KB9FO | 1 | V5 #1 |

## 900 MHZ

| | | | |
|---|---|---|---|
| 900/1200 AM/FM TEST SIGNAL SOURCE | W8DMR | 2 | V3 #2 |
| RABBIT DOUBLE PLAY | W1NRE | 4 | V3 #2 |
| CHEAP 900 RX/TX (RABBITS) | ATVQ | 1 | V4 #2 |
| 913 MHZ XTAL LOW LEVEL SIGNAL SOURCE | K7YZZ | 2 | V4 #2 |
| 900 MHZ ATV TX | K7YZZ | 2 | V4 #3 |
| 900/1200 12 WATT ATV SYSTEM | KS8J | 3 | V5 #1 |
| CONSTRUCTION OF 900 MHZ TRANSPOSER | ZL2TAR | 3 | V6 #2 |
| RABBIT POWER, DIAGRAMS AND BINARY FREQUENCY CODE | N8PXW | 2 | V9 #3 |

## 1200 MHZ

| | | | |
|---|---|---|---|
| 23 CM PLL EXCITER FOR ATV | W8DMR | 3 | V2 #4 |
| SOURCE FOR PLESSY CHIP FOR EXCITER | W8DMR | 1 | V2 #1 |
| 23 CM (1270 MHZ) AM/FM TX (CONTINUED FROM V2 #4) | W8DMR | 6 | V3 #2 |
| UPDATE/CORRECTION | W8DMR | 1 | V3 #2 |
| PLESSY CHIP SOURCE | W8DMR | 1 | V4 #1 |
| TVG12A FREQUENCY LOCK | WB8URI | 1 | V4 #1 |
| 900/1200 AM/FM TEST SIGNAL SOURCE | W8DMR | 2 | V3 #2 |
| 23 CM FM TX (SEVERNSIDE PRODUCT) | P5 | 1 | V3 #3 |
| 2C39 CAVITIES, THE REAL STORY | W4WSR | 5 | V4 #2 |
| 900/1200 12 WATT ATV SYSTEM | KS8J | 3 | V5 #1 |
| SIMPLE 24 CM FM VIDEO TRANSMITTER | VK4XRL | 1 | V5 #1 |
| 24 CM ATV TRANSMITTER | HB9CIZ | 10 | V7 #2 |
| DIAGRAM REPRINT | HB9CIZ | 1 | V7 #3 |
| 23 CM SUPERHETRODYNE ATV TRANSMITTER | G6TVJ | 4 | V7 #3 |

## 2300 MHZ

| | | | |
|---|---|---|---|
| MICROWAVE OVEN FM ATV TX | PACHOLOK | 1 | V2 #1 |
| MICROWAVE OVEN FM ATV TX | W8DMR/PACHOLOK | 5 | V2 #2 |
| MICROWAVE OVEN FM TX UPDATES | WA8EOY | 1 | V2 #3 |
| MICROWAVE OVEN FEED LINE | ATCO | 1 | V3 #4 |
| 2C39 CAVITIES, THE REAL STORY | W4WSR | 5 | V4 #2 |
| OSCILLATOR/MULTIPLIER CHAIN FOR 2.3 GHZ | G4DDK | 6 | V7 #1 |
| 23 CM ATV TRANSMITTER, SURFACE MOUNT DEVICES | HB9CIZ | 10 | V7 #2 |
| SYNTHESIZED 23 CM FM TV TRANSMITTER | G4WIM | 5 | V7 #2 |
| 13 CM FM ATV EXCITER | DJ8ES | 5 | V8 #3 |

## 10 GHZ

| | | | |
|---|---|---|---|
| 10 GHZ FM ATV SYSTEM | KB0XC | 3 | V4 #2 |
| 10 GHZ FOR ATV | G8KUW | 2 | V6 #1 |
| 10 GHZ MICROWAVE PARTS | SHF PARTS | 3 | V7 #1 |
| HIGH POWER AMPS | G8KUW | 1 | V7 #2 |

# VIDEO

| | | | |
|---|---|---|---|
| SPECTRUM CRUNCH/HDTV INTRO | KB9FO | 1 | V2 #1 |
| UNIVERSAL HIGH DEF COMPUTER INTERFACE | N7QM | 1 | V2 #1 |
| RADIO SHACK SEG FOR DUAL SOURCE SUPER | KD0LO | 1 | V2 #2 |
| VIDEO PROCESSOR | WA6SVT | 1 | V2 #2 |
| REMOTE PUSH TO LOOK | WY5V | 1 | V2 #3 |
| FSTV AND THE AMIGA (TITLE GENERATOR) | KD0LO | 1 | V2 #3 |
| CHROMA KEY WITH RADIO SHACK SEG | KD0LO | 3 | V2 #4 |
| VIDEO DA AMPS | CQ-TV | 1 | V3 #1 |
| RGB TO NTSC ENCODER | KS8J | 6 | V3 #2 |
| UPDATE OUTPUT CIRCUIT | W8DMR | 1 | V4 #1 |
| EXTEND VCR REMOTE CONTROL | K0OV | 2 | V3 #2 |
| RABBIT DOUBLE PLAY | W1NRE | 4 | V3 #2 |
| STEALING SYNC AND OTHER DESPICABLE PASTIMES | KD0LO | 3 | V3 #3 |
| INEXPENSIVE REMOTE CONTROL ZOOM LENS | WB4APR | 1 | V3 #3 |
| SONY CAMERA WIRING | WA9JMN | 1 | V3 #3 |
| VIDEO SYNC SEPARATOR | ZL1UJK | 2 | V3 #3 |
| TEA2000 COLOR CODER | ZL1UJK | 1 | V3 #3 |
| C-64 CALL LETTER PROGRAM | ATCO | 1 | V3 #4 |
| C-64 BILLBOARD PROGRAM | N7AON | 1 | V4 #1 |
| C-64 ID PROGRAM | N7AON | 1 | V4 31 |
| C-64 PROGRAM CHANGE TO VOL 3 #4 | K6YDW | 1 | V4 #1 |
| VERTICAL INTERVAL TEST SIGNAL MONITOR | KD0LO | 3 | V4 #1 |
| AUTO RECORDING ON VCR | K6YDW | 1 | V4 #1 |
| LIONEL RAILSCOPE (CAMERA FOR ATV) | WB8ELK | 3 | V4 #2 |
| VIDEO CAMERA 10 PIN CONNECTOR PIN-OUT | ATVQ | 1 | V4 #3 |
| VIDEO PROC AMP AND LOW PASS FILTER | W9DUU | 2 | V5 #1 |
| BUILD COLOR CORRECTOR/PROC AMP | STEVENS | 9 | V5 #2 |
| MULTIMEDIA AND ATV | LAZ TECH | 1 | V5 #4 |
| CONTROL ATV TX WITH CAMERA PAUSE BUTTON | N3EZD | 1 | V5 #4 |
| GETTING ON ATV FOR UNDER $100 | W6OAL | 1 | V6 #1 |
| INSIDE THE VIDEO TOASTER | K3HKR | 3 | V6 #2 |
| VGA TO NTSC, ELITE | KD0LO | 2 | V6 #3 |
| PLAY PAL ON NTSC VCR | WA0POL | 1 | V7 #1 |
| FM VIDEO DEVIATION, THEORY AND APPLICATION | WB9OQM | 3 | V7 #1 |
| TELEPROMPTER FOR ATV | K0ROL | 1 | V7 #1 |
| REMOTE CAMERA PAN AND TILT | WD5BJW | 1 | V7 #3 |
| VIDEO CROSS FADER | GW8AGI | 2 | V7 #3 |
| TRANSMIT/RECEIVE SEQUENCER | N3EZD | 3 | V7 #4 |
| BUILD A VIDEO DA | KB0GL | 1 | V7 #4 |
| VGA TO NTSC | KF8QU | 1 | V8 #4 |

***7100 WORDS LATER...THE END TILL NEXT ISSUE!***

# A 10 WATT POWER AMPLIFIER FOR THE 13CM BAND

**USING GAAS TECHNOLOGY DEVELOPED WITH THE HELP OF PUFF CAD SOFTWARE**

by Harold Fleckner DC8UG

from VHF Communications Vol. 27 #4

The two-stage power amplifier introduced in issue 3/1994 (1) of VHF Communications supplies an output power of 5 Watts in the 13cm band in linear operation (class A) with 23 dB amplification.

The article below introduces a new amplifier in this development range, which yields an output power of 10 Watts with a linear amplification of 20 dB.

The circuit and layout have once again been set up using Puff CAD software (4), on the basis of the results from the development work on the 5 Watt amplifier. As a result of this, a parallel circuit with two 5 Watt stages has been inserted in the high-level stage of this amplifier unit.

*Choice of Semiconductor*

The transistors used in the amplifier are Mitsubishi GaAsFETs from the 0900 range. The 0905 type is used in the driver stage with two type 0906's in the parallel high-level stage.

The following performance data were the targets aimed for in the development work:

| | |
|---|---|
| Amplification | 20 dB at K 1 |
| Output power | Min. 10 W at max. 1 dB compression |
| Band width | 100 MHz |
| Zin = Zout | = 50 with return loss > 20 dB |

Arguments in favor of using a parallel high-level stage consisting of two 5 Watt transistors (as opposed to a single stage with a 10 Watt transistor) are the higher efficiency and the higher (in total) power loss of the parallel-switched high-level stage transistors and the, at present, rather more favorable cost/performance

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# A 10 WATT POWER AMPLIFIER

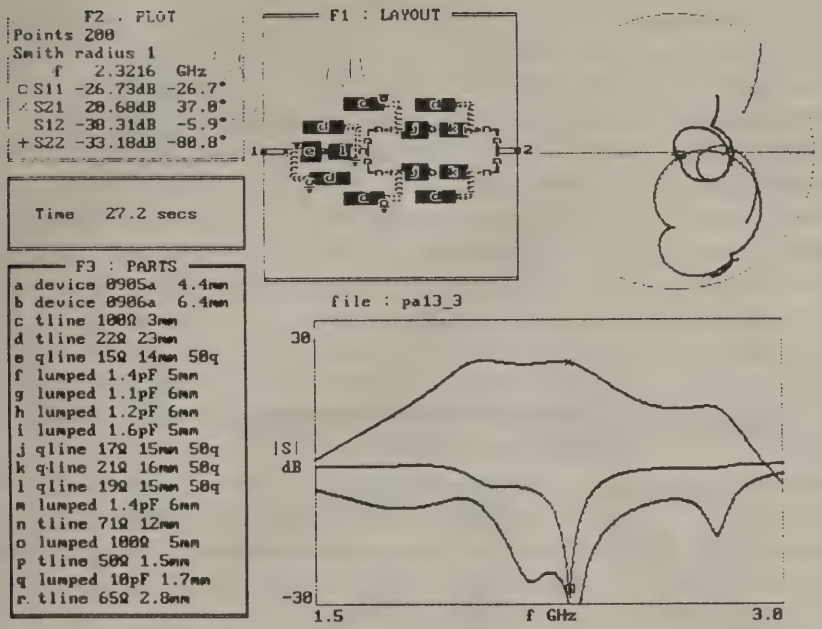


**Fig.1: PUFF CAD Program Screen Print-Out**

ratio of the 0906 GaAsFET, as against the 10 Watt 0907 type.

According to the Mitsubishi data sheet, in the given frequency range the 0906 attains an output power of 5.0 Watts = 37 dBm at Uds = 10 V, Ids = 1.1 A, with an amplification of 11 dB at 40% efficiency.

In comparison with the 0907 type (40 dBm output power / 10 dB /37%), there is a lower power advantage in favor of the two parallel-wired 0906 stages.

The 0905 type comfortably supplies the necessary drive power of app. 1 Watt for the parallel stage with an amplification of approximately 10 dB. Its typical power is given by Mitsubishi as app. 34 dBm = 2.5 Watts at 8 V / 0.8 A.

The S-parameters for the selected transistors required for the circuit development are taken from the Mitsubishi data bank and are valid for the DC voltage conditions referred to above.

In operation, there is a DC input power exceeding 30 Watts, so the heat sink must have generous dimensions, in order to guarantee that the maximum permissible temperature for the transistors, of 175° is never reached.

### *Simulation and Analysis of Amplifier Circuit using CAD Software*

The functioning of the Puff CAD software is comprehensively described in (2) (3) (4), so only the results obtained are presented and analyzed here. Fig. 1 shows the screen printout from Puff with the draft layout of the circuit, the associated Smith diagram, the parts list and the scatter parameter curve over the selected frequency range (1.5 - 3.0 GHz).

From the calculated scatter parameters, the stability factor, K, of the amplifier circuit can be subsequently determined for the operating frequency (2.3216 GHz) (5). When plotted against the frequency, the gain slope obtained (S21) clearly shows the influence of the 71 L/4 coupler between the two high-level transistors. This type of coupling presupposes a transformation of all individual stages with a 50 impedance, and is well known from aerial engineering. It is relatively loss-free and is particularly effective when each individual stage is transformed before the hookup on the calculator to Zin - Zout = 50 . The better this transformation is carried out, the "smoother" the gain slope actually obtained is, plotted against the frequency.

The calculated input impedance (S11) is more strongly dependent on the frequency than the output impedance (S22), and here the typical broadbandedness of parallel stages shows to advantage. The values shown in Fig. 1 give the following performance values for the simulated circuit at an operating frequency of 2,320 MHz:

| | |
|---|---|
| Return loss input: | - 26.7 dB |
| Return loss output: | - 33.2 dB |

# A 10 WATT POWER AMPLIFIER

Amplification: + 20.7 dB
Feedback: - 38.3 dB
K factor at 2,320 Mhz 29
Power band width (-3 dB): - 400 MHz + 100 Mhz

*Parts List*

| | | | |
|---|---|---|---|
| C1 | Trimmer | 2.5 pF | Teflon/Ceramic |
| C2 | Trimmer | 2.5pF | Teflon/Ceramic |
| C3 | Trimmer | 2.5pF | Teflon/Ceramic |
| C4 | Trimmer | 2.5pF | Teflon/Ceramic |
| C5 | Trimmer | 2.5pF | Teflon/Ceramic |
| C6 | Trimmer | 2.5pF | Teflon/Ceramic |
| C7 | Capacitor | 4.7pF | ATC-Chip 100 |
| C8 | Capacitor | 4.7pF | ATC-Chip 100 |
| C9 | Capacitor | 4.7pF | ATC -Chip 100 |
| C10 | Capacitor | 4.7pF | ATC-Chip 100 |
| J1 | Socket N-type or SMA | | |
| J2 | Socket N-type or SMA | | |
| L1 | Inductor | 100/24mm Stripline | |
| L2 | Inductor | 65/23mm Stripline | |
| L3 | Inductor | 100/24mm Stripline | |
| L4 | Inductor | 65/23mm Stripline | |
| L5 | Inductor | 100/24mm Stripline | |
| L6 | Inductor | 65/23mm Stripline | |
| T1 | FET 0905 | Mitsubishi | |
| T2 | FET 0906 | Mitsubishi | |
| T3 | FET 0906 | Mitsubishi | |
| ZS | Inductor | 22/23mm Stripline | |
| Z1 | Inductor | 15/14mm Stripline | |
| Z2 | Inductor | 19/15mm Stripline | |
| Z3 | Inductor | 17/15mm Stripline | |
| Z4 | Inductor | 21/16mm Stripline | |
| Z5 | Inductor | 17/15mm Stripline | |
| Z6 | Inductor | 21/16mm Stripline | |
| ZT1-ZT4 | Inductor | 71/24/mm Stripline | |

Fig. 2 shows the layout generated by the CAD software as a laser printout, for Teflon-based material with a substrate thickness of 0.79 mm.

The earth paths on the longitudinal and transverse sides of the boards are surfaces which are added later and which are through-hole plated to the underside of the boards.

In the parts list we can also recognize the necessary discrete components of the circuit, under the description "lumped." Here we are dealing with capacitors and resistances which are necessary for the circuit to operate.

Fig. 3 shows the wiring diagram for the 10 Watt parallel high-level stage.

*Amplifier Assembly*

The amplifier circuit is assembled on a Teflon board (er=2.33) with the dimensions 146 mm. x 72 mm. x 0.79 mm. For its part, it is screwed to an aluminum finned cooling body with dimensions of 147 mm. x 100 mm. x 40 mm., which acts as a fastening and a heat sink for the power transistors and voltage regulator (Fig. 5a).

The DC voltage supply is mounted on a double-coated epoxy board, measuring 105 mm. x 20 mm. x 1.6 mm., internally soldered vertically to the longitudinal side of the housing (Fig. 5b). Its circuit and structure correspond to the publications as per (6) or (1).

Fig. 6 shows the wiring diagram, Fig. 7 the components diagram, and Fig. 8 the parts list for this power supply. The components are all mounted on the foil side, so that the earth surfaces have to be through-hole plated.

Grooves are milled in the cooling body, so that the drain and gate connections of the transistors can be soldered as flat as possible to the board. The grooves are laid out a little wide, to give a greater tolerance in the mounting of the transistors.

The Teflon board has a recess of 4.5 mm. x 17 mm. and two recesses of 6.5 mm. x 22 mm., into which the transistors are inserted and then screwed to the cooling body (see Fig. 5). Between the board and the cooling body, there is also some copper foil (dimensions 148 mm. x 73 mm. x -0.08 mm.), which is later soldered to the tinplate housing. It improves the earth connection between the transistors, the board, the housing and the cooling body.

Before the board is installed, the earth surfaces must be through-hole plated using 2-mm. diameter hollow copper rivets. Here there should be 3 or 4 rivets per longitudinal side and 1 or 2 rivets per earth link (see Fig. 5). The board is fastened to the cooling body by means of 8 M2 screws. The transistors need 2 threaded holes each in the baseplate for the source connection.

The tinplate housing (147 mm. x 72 mm. x 28 mm.) is provided with the appropriate holes and recesses before assembly. The housing is soldered together and soldered to the screwed-on board on the longitudinal sides. The soldered-on sockets are also screwed into the front faces of the cooling body.

The best approach is to assemble the components and bring them into operation in the following sequence:

# A 10 WATT POWER AMPLIFIER

Assemble and incorporate the power supply board. The gate resistances (R4, R5) should already be soldered to the power supply for a better assembly! Tip: To avoid regenerative feedback, the gate power supply connection for the transistor, T3, through the resistance, R6, may not go straight across the board, but must be taken round outside, like the drain power supply (see Fig. 5).- Install and wire up the 8 feedthrough capacitors (1 nF) and the blocking capacitors, C9 - C15, C17, C19. Insulated fastening and connecting of voltage regulator using feedthrough capacitors. - Install and connect resistances (R7, R8, R9, R11, R12) on and to high-frequency board.

- Install trimmers (C1 - C6). Tip: Ceramic trimmers of the Johanson 0.5 - 2.5 pF type are more suitable than Teflon trimmers, as they still give stable capacity values, even after repeated calibrations! Install chip capacitors (C7 - C10) Tip: You should definitely use the very low loss ATC 100 porcelain type from Johanson. - De-bugging the power supply (UG and UD). - Install GaAsFETs. -Set zero signal currents: 0905 - ID = 0.8A; 0906 - ID = 1.1A.

***Readings***

After calibration at 2,320 Mhz, the prototype attained an output power of 11 Watts with a driving power of 120 mW. The measurement was carried out using an HP 432B Wattmeter and a 30 dB + 10 dB attenuator from Narda.

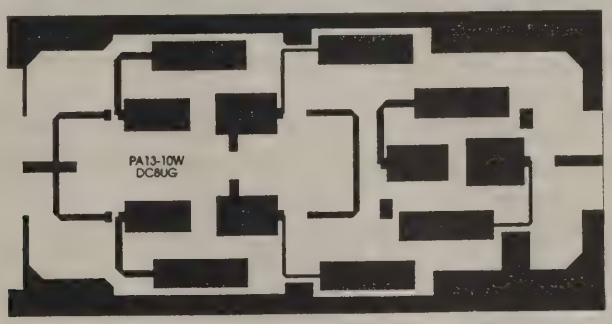


**Fig.2: PCB Layout for the 10 Watt High-Level Stage**

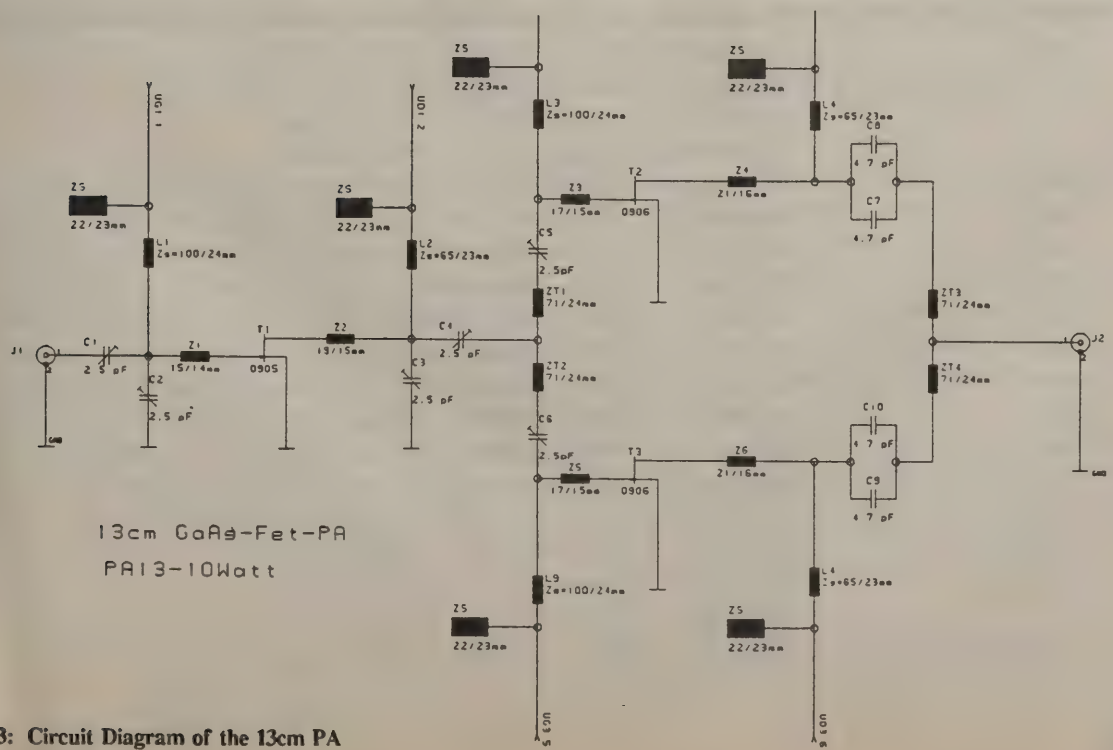


**Fig.3: Circuit Diagram of the 13cm PA**

# A 10 WATT POWER AMPLIFIER

| | | | |
|---|---|---|---|
| C1 | Capacitor | 1nF | Feed-Through |
| C2 | Capacitor | 10 uF | Tantalum 16V |
| C3 | Capacitor | 10 uF | Tantalum 16V |
| C4 | Capacitor | 22 uF | Tantalum 10V |
| C5 | Capacitor | 22 uF | Tantalum 10V |
| C6 | Capacitor | 10 uF | Tantalum 10V |
| C7 | Capacitor | 10 uF | Tantalum 10V |
| C8 | Capacitor | 10 uF | Tantalum 10V |
| C9 | Capacitor | 0.1uF | Tantalum 10V |
| C10 | Capacitor | 0.1 uF | Tantalum 10V |
| C11 | Capacitor | 10 uF | Tantalum 10V |
| C12 | Capacitor | 10 uF | Tantalum 16V |
| C13 | Capacitor | 10 uF | Tantalum 16V |
| C14 | Capacitor | 10 uF | Tantalum 16V |
| C15 | Capacitor | 100 nF | |
| C16 | Capacitor | 1 nF | Feed-Through |
| C17 | Capacitor | 100 nF | |
| C18 | Capacitor | 1 nF | Feed-Through |
| C19 | Capacitor | 100nF | |
| C20 | Capacitor | 1 nF | Feed-Through |
| D1 | Diode ZD16 | Zener | |
| D2 | Diode ZD4.7 | Zener | |
| Ic1 | Voltage Regulator | LT1084 | Low Drop TO247 |
| IC2 | Voltage Regulator | 78L06 | TO92 |
| IC3 | DC-DC Converter | ICL7660 | DIL8 |
| P1 | Potentiometer 2.5k (2k ) | | Piher/Cermet |
| P2 | Potentiometer 2.5k (2k ) | | Piher/Cermet |
| P3 | Potentiometer 2.5k (2k ) | | Piher/Cermet |
| R1 | Resistor | 2k (2.2k 2.2k) | Metal Film |
| R2 | Resistor | 270 | Metal Film |
| R3 | Resistor | 10 k | Metal Film |
| R4 | Resistor | 470 | Metal Film |
| R5 | Resistor | 470 | Metal Film |
| R6 | Resistor | 470 | Metal Film |
| R7 | Resistor | 470 | SMD |
| R8 | Resistor | 470 | SMD |
| R9 | Resistor | 470 | SMD |
| R10 | Resistor | 3 / 1.5W | Metal Film (3 x 10 ) |
| R11 | Resistor | 0.5 / 1W | Metal Film (2 x 1 ) |
| R12 | Resistor | 0.5 / 1W | Metal Film (2 x 1 ) |
| T1 | Transistor | BC546B | NPN TO92 |

+5 1nF Feed-Through Capacitors for PSU from UG3 and LT1084 (see Fig.5)

# VS-90 ATV Repeater Controller

**4 Video Inputs. 4 Audio Inputs. Repeater, Manual & beacon modes.**
**Video ID Input. Control receiver input. Built in CW ID (DTMF Programmed).**
**Completely DTMF programmed w/full set of control and user codes.**
**User *transmit* test mode. User *receive* test mode.**
**PTT output with relay for either pull-to-ground or power supplied PTT.**
**Eleven (11) pots for video and audio adjustment. Built-in 115 VAC power supply.**
**DTMF remotely programmable control & user codes, CW ID, time-outs, etc**
**Programmed parameters and data stored in EEPROM *not* requiring battery for backup.**
**DC coupled video and audio for no phase shift or distortion.**
**Horizontal Sync detector built in. Separate Video switching between video inputs and video ID.**
**Enclosed in 19" rack mount enclosure with rear connectors.**
**Complete manual w/schematics, operational and programming details.**

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# A 10 WATT POWER AMPLIFIER

This amplifier can be used in the ATV range at 2,380 MHz - with rather less amplification for the same output power, of course. The author therefore developed an amplifier specially designed for the ATV range, with a maximum amplification level app. 80 MHz higher. Another article in the near future will give details of the layout and the readings obtained.

Note: The PUFF CAD software package used in this project is available from KM publications at the usual address. The price of the software at the time of publication of this article is £20.00 plus shipping at cost.

***Literature***


(1) Fleckner, H.: A Power Amplifier for the 13cm Band using GaAs Technology; VHF Communications 3/1994; pp. 130-141.

(2) Bertelsmeier, R.: PUFF-Design Software; Dubus-Info; vol. 18 (1989, no. 4; pp. 30-33.

(3) Lentz, R.E.: PUFF - a CAD Program for Microwave Stripline Circuits; VHF Communications 2/1991; pp. 66-68.

(4) Wedge, S.W., Compton, R. and Rutledge. D.:PUFF Computer Aided Design for Microwave Integrated Circuits; available from KM Publications.

(5) Unger / Harth: High-Frequency Semi-Conductor Electronics; Hirzel-Verlag Stuttgart; ISBN 37776 0235 3.

(6) Kuhne, M.: High-Power GaAs-FET Amplifier for 9 cm; Dubus-Info, vol 20 (1991), no. 2; pp. 7-16.

# A 10 WATT POWER AMPLIFIER

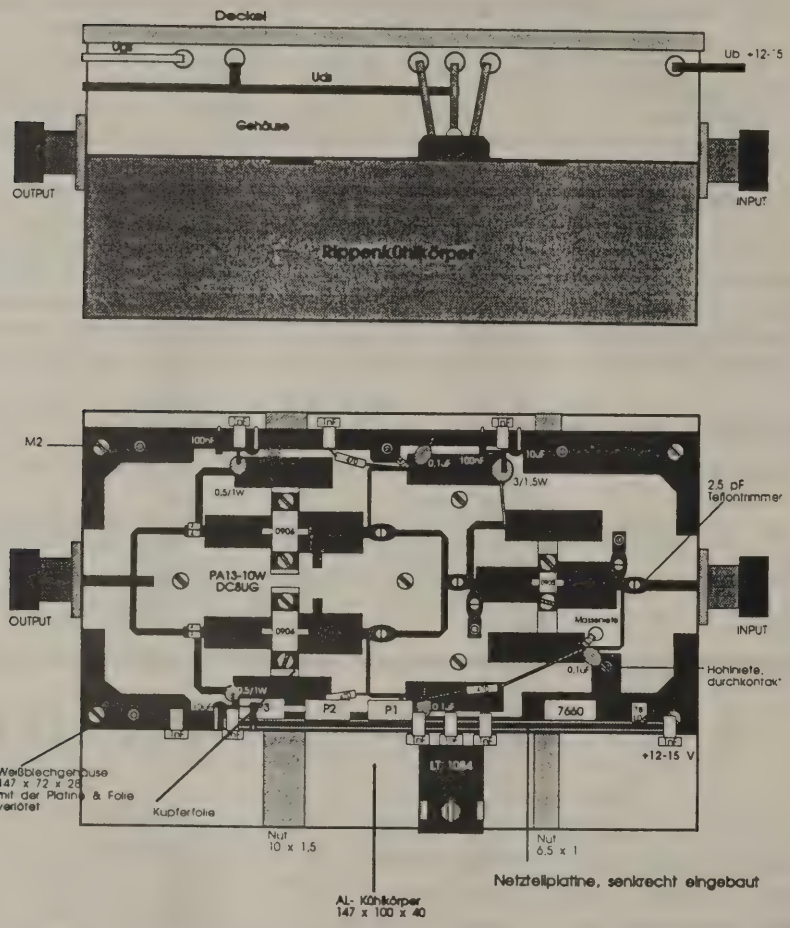


**Fig.5a: Side View of a finished unit** **Fig.5b: Component Layout**

***Deckel*** = Cover; Gehäuse = Cover; ***Rippenkülkörper*** = Finned Cooling Body;
***Mit der Platine & Folie Verlötet*** = Soldered to Board and Foil;
***Weißblechgehäuse*** = Tinplate Housing; ***Kupferfolie*** = Copper Foil;
***Nut*** = groove; ***Masseniete*** = Solid Rivets; ***Kühlkörper*** = Cooling Body;
***Hohlniete, durchkontaktiert*** = Hollow rivet, through-hole plated;
***Netzteilplatine, senkrecht eingebaut*** = PSU board, vertically inserted

# A 10 WATT POWER AMPLIFIER

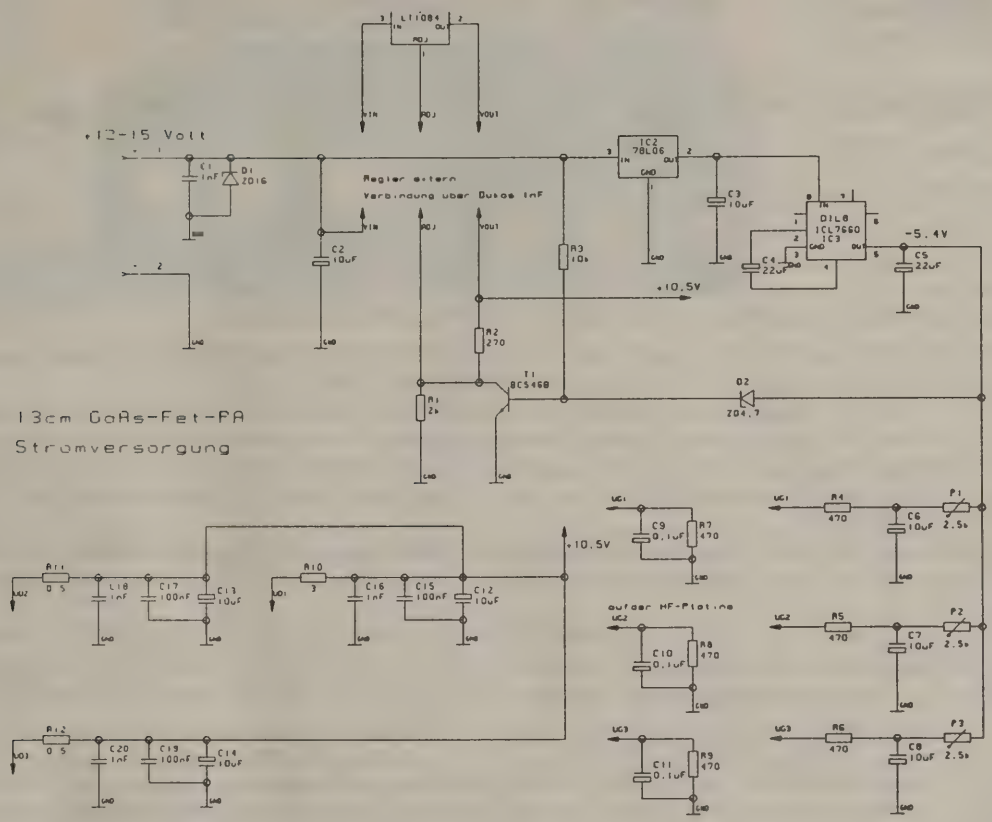


Fig.6: Circuit Diagram of the PSU

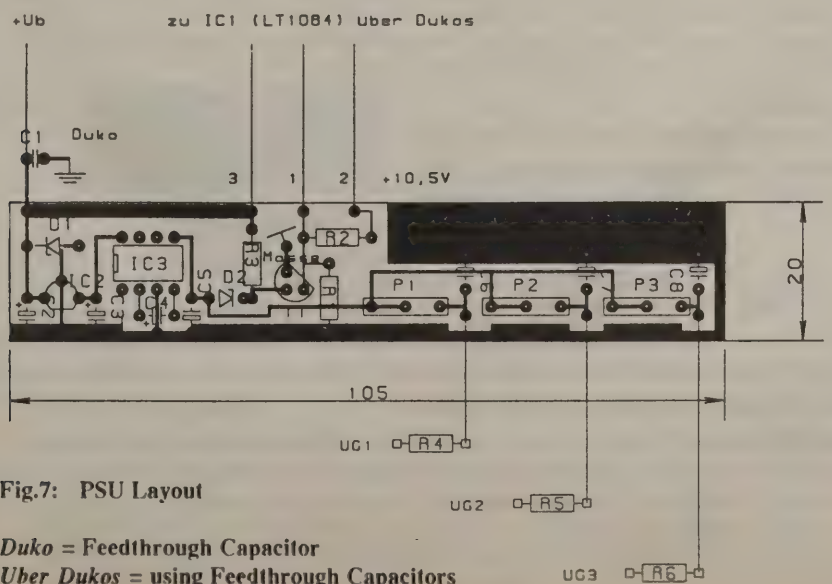


Fig.7: PSU Layout

*Duko* = Feedthrough Capacitor
*Uber Dukos* = using Feedthrough Capacitors

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Delivered UPS surface in contiguous USA

**TX33-1b SPECIAL FEATURES:** **902-928 MHz 33cm AMATEUR BAND**

* ≥ 1W p.e.p. continuous duty transmitter properly matches Downeast Microwave 3318PA 20 watt linear amp with adjustable internal sync stretcher on the time proven TXA5-33 transmitter board.
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* Full 25 kHz dev. broadcast standard 4.5 MHz sound subcarrier with independant mic and line audio controls allow voice over commenting while showing home video tapes. Uses FMA5 board. Accepts low impedance dynamic mics with "Push to Look" switch.
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DX for snow free pictures in line of sight conditions using the Directive Systems 3318LYARM 14.3 dBd Yagi beams is 11 miles or 50 miles with the 20 watt amp. Just plug in your camera,VCR, camcorder, etc. composite video and audio, 33cm antenna, 12 to 14 Vdc @ 1A, and you are ready to transmit live action color or black and white pictures with sound to other amateurs. We stock 910.25 or 923.25 MHz, the most popular frequencies for simplex or repeater input. 911.25, 913.25, 914.8 and 919.25 MHz available on special order.

The TX33-1b has full bandwidth for color, sound and live action just like broadcast. You can show the shack, home video tapes, computer programs, Internet, radio club meetings, repeat SSTV, weather radar, or even Space Shuttle video if you have a home satellite receiver. For more basic info on ATV see the 1985 to 94 ARRL Handbook chapters 20 & 7, or new 1995-7 edition chapt. 12. For activity in your area check the ARRL Repeater Directory for local ATV repeaters or call or email us.

*Transmitting equipment sold only to licensed Tech class or higher radio amateurs verified in the Callbook for legal purposes. If newly licensed, moved or upgraded, mail or fax copy of license or test certification.

Suggested antenna:
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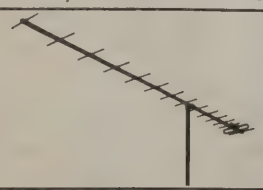
**If you prefer a vertical omni with 10 dBd gain, we have the Comet FP-19 for $119 Length is 7' 4"**



**16 dBd High Gain Beam - DSFO ATV-25.....$149**
In stock, a higher gain replacement for the DXers choice Rutland FO22-ATV yagi. This 25 element version gets more than 16 dBd on a 17 ft boom. 420-440 MHz. Center mount, 8.5 lbs, 100 mph. See 1996 ARRL Handbook page 20.64 for description of this fine K1FO designed antenna now maufactured by Directive Systems. Price is delivered UPS surface.

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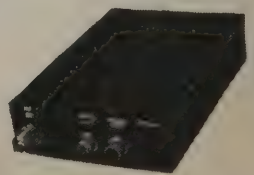
Now you can take the channel 3 output of your 70cm or 33cm ATV downconverter and directly get video and line audio out to drive a monitor using this module. For mobile and portable, you can use your camcorder viewfinder to view instead of a TV set or record the direct video without a tuner. Use a splitter between a TV and this unit into a 1/2 MHz low pass filter before the monitor for digging out weak signal DX. Comes with Wall plug AC 120/16V power supply but can be run on external 13.8 Vdc - internal 12 Vdc regulator, see Fall 96 ATVQ W6ORGy Notes.



5x3.3x1.5".

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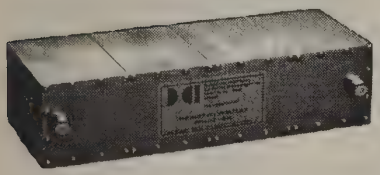

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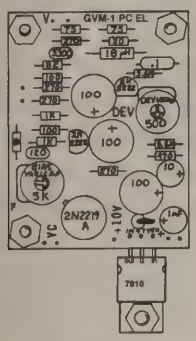


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Make a line of sight link to connect repeaters, NASA Select or weather radar feed, or remote base your station. Other types of sources such as high speed digital can also be modulated if set for 1 V p-p at the GVM-1 input. Getting on 10 gHz microwave is easy and not expensive. To receive, connect the mixer terminal on the gunnplexer through a 20 dB TV amp to the input of a 70 MHz surplus FM satellite TV receiver or amateur receiver such as the HFT IF70 ($249).
Wired and tested board for use with 10 and 24 GHz Gunnplexer modules that have a separate varicap input. Designed to drive a long RG-6U coax with a 75 Ohm termination at the varicap for remoting. Supplies primary regulated +10V up to 1A to Gunn diode input - series 1N4001 diodes can be put in series (.7V ea.) for lower required voltages of other types of Gunnplexers. Provision for sound from 1 or 2 FMA5 boards. Requires +12 to 15 Vdc at 30 ma plus Gunplexer current. Has standard US CCIR 405-1 video pre-emphasis and pot for setting 4 or 11 MHz deviation. Pot for fine varicap bias frequency adjust.

Gunnplexer

10 mW Gunnplexers available from SHF Microwave for about $40 to $60. Write for their catalogue to 7102 W. 500 S., La Porte IN, 46350. Email: arutz@shfmicro.com
Check out their web page: www.shfmicro.com

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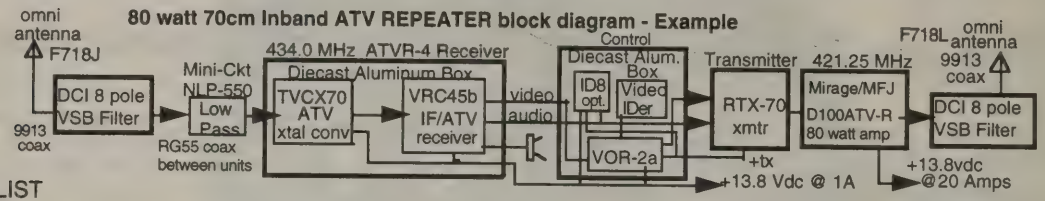
# ATV Repeater Cost Examples



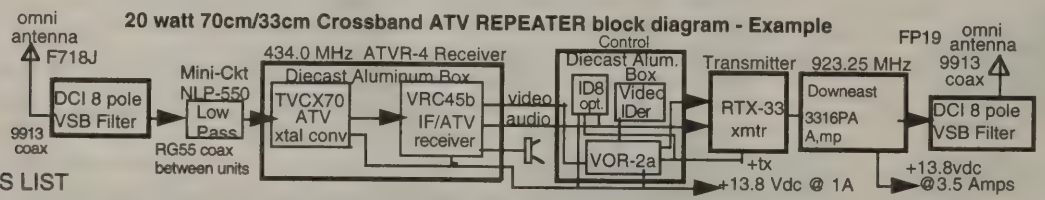

**80 watt 70cm Inband ATV REPEATER block diagram - Example**

PARTS LIST

| Description | Model # | Manufacturer | Source | Cost |
|---|---|---|---|---|
| Antenna 430-440 MHz | F718J | Diamond | P. C. Electronics | $238 |
| Antenna 420-430 MHz | F718L | Diamond | P. C. Electronics | $238 |
| ATV Receiver 70cm | ATVR-4 | P. C. Electronics | P. C. Electronics | $319 |
| ATV Transmitter 70cm | RTX-70 | P. C. Electronics | P. C. Electronics | $279 |
| Video Operated Relay board | VOR-2a | P. C. Electronics | P. C. Electronics | $45 |
| 80W (100 w pep) Linear Amp | D100ATVR | MFJ/Mirage | P. C. Electronics | $589 |
| 70cm VSB filter 421.25 MHz | DCI-421.25-6C | DCI | P. C. Electronics | $279 |
| 70cm VSB filter 434.0 MHz | DCI-434.0-6C | DCI | P. C. Electronics | $279 |
| MCW call IDer board (optional) | ID-8 | Comm. Specialists | P. C. Electronics | $89 |
| Die Cast Aluminum box | CAB 247 | LMB Heeger | P. C. Electronics | $22 |
| Low Pass inline filter | NLP-550 | MiniCircuit Lab | MiniCircuit Lab | $40 |
| Power Supply 13.8 Vdc @ 2.5A | RS 22-504 | Radio Shack | Radio Shack | $39.99 |
| Power Supply 13.8 Vdc @ 20A | RS-20M | Astron | AES | $119.95 |
| 50 Ohm Coax Cable, 250 ft roll | 9913 | Belden | AES | $129.95 |
| Video Identifier (optional) | VDG-1 | Elktronics | Elktronics | $99 |
| | | | Total | $2805.89 |

**Call, Write or Email for our ATV Repeater Application Notes.**

Add about $200 for a DTMF controller, miscellaneous hardware, interconnect cables and connectors.




**20 watt 70cm/33cm Crossband ATV REPEATER block diagram - Example**

PARTS LIST

| Description | Model # | Manufacturer | Source | Cost |
|---|---|---|---|---|
| Antenna 430-440 MHz | F718J | Diamond | P. C. Electronics | $238 |
| Antenna 902-928 MHz | FP-19 | Comet | P. C. Electronics | $119 |
| ATV Receiver 70cm | ATVR-4 | P. C. Electronics | P. C. Electronics | $319 |
| ATV Transmitter 33cm | RTX-33 | P. C. Electronics | P. C. Electronics | $329 |
| Video Operated Relay board | VOR-2a | P. C. Electronics | P. C. Electronics | $45 |
| 20W 33cm Linear Amp | 3318PA | Downeast Micro. | Downeast Microwave | $275 |
| 70cm VSB filter 434.0 MHz | DCI-434.0-6C | DCI | P. C. Electronics | $279 |
| 33cm VSB filter 923.25 MHz | DCI-923.25-6C | DCI | P. C. Electronics | $279 |
| MCW call IDer board (optional) | ID-8 | Comm. Specialists | P. C. Electronics | $89 |
| Die Cast Aluminum box | CAB 247 | LMB Heeger | P. C. Electronics | $22 |
| Low Pass inline filter | NLP-550 | MiniCircuit Lab | MiniCircuit Lab | $40 |
| Power Supply 13.8 Vdc @ 2.5A | RS 22-504 | Radio Shack | Radio Shack | $39.99 |
| Power Supply 13.8 Vdc @ 7A | RS-7A | Astron | AES | $59.95 |
| 50 Ohm Coax Cable, 250 ft roll | 9913 | Belden | AES | $129.95 |
| Video Identifier (optional) | VDG-1 | Elktronics | Elktronics | $99 |
| | | | Total | $2362.85 |

12/96

# THE ULTIMATE SYNC DETECTOR

## BY MIKE DEES N3EZD

In the Summer 1995 issue of ATVQ a sync detector circuit was described by Heru, W3WVV. Heru developed the sync detector for use on the Baltimore Radio Amateur Television Society's ATV repeater in Baltimore, Maryland. The circuit was very sensitive and would respond to video at the Pl level. The sync detector circuit is shown in figure 1.

The Baltimore, Maryland, and York, Pennsylvania, ATV groups are in the process of linking our repeater systems. It was decided to use this sync detector circuit in the linking project. BRATS also has plans to modify the controller on our ATV repeater, this would require several sync detectors. I decided to design a printed circuit board for the circuit to facilitate its use in the planned projects. The board foil pattern is shown in figure 2, the component placement in figure 3, and a parts list is shown below. The pads connected to Ul pins 10-16 are for experimental purposes.

The sync detector circuit board is designed to operate on 12 to 15 volts DC. If +5VDC is available you may eliminate the 78L05 and connect +5V to the indicated pad. Supply 1 Vpp video to the input. The output is active low and has a pullup resistor (R13) to 5V. For an open collector output, do not install R13.

To adjust the detector:

1. apply P5 video to the input, 2. monitor the cathode of D2 with a scope, adjust R8 for best sync separation,
2. monitor U2 pin 3 with a scope and adjust R10 for 0.5 Vpp,
3. adjust Rll to the middle of the detection range, or with no video at the input adjust Rll so the 567 free running frequency is approximately 15,734 Hz (connect a frequency counter to U2 pin 6 through a 500k resistor).

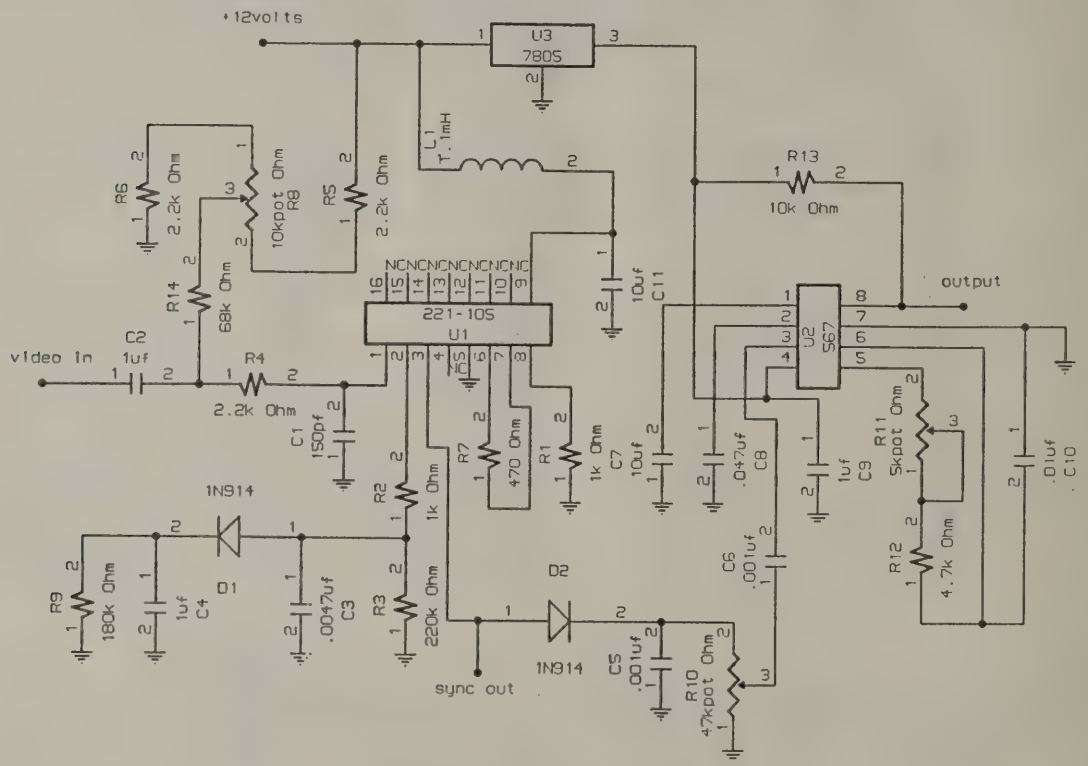
The sync detector circuit board may be purchased from John Shaffer, W3SST, 2596 Church Road, York, PA, 17404, 717-764-4805. John has a whole line of circuit boards that he sells, such as an ATV line sampler, video IF detector, QRP watt meter, ATV modulator, VHF and UHF linear amplifiers, 2W ATV transmitter, and many more. John will also produce single and small quantities of printed circuit boards from your design at very reasonable prices. Single sided, double sided, and plated through boards can be produced. Contact John for prices.

| | | |
|---|---|---|
| Cl | 150pf 500v Cer. Disk | P4102A |
| C2,C4,C9 | l mf 35V Tan. | P2059 |
| C3 | .0047uf 63V Mono. Cer. | P4879 |
| C5,C6 | .OOl uf 63V Mono. Cer. | P4812 |
| C7,Cll | lO uf 35v Tan. | P2065 |
| C8 | .047 uf 63V Mono. Cer. | P4885 |
| C10 | .Ol uf 250v Metal Polyester | 3007PH |
| Dl D2 | lN914 (lN4148) | lN4148CT |
| Ll | 1000 uH | M7849 |
| R1, R2 | 1K | 1000QBK |
| R3 | 220k | 220000qbk |
| R4, R5, R6 | 2.2k | 2200QBK |
| R7 | 470 ohm | 470QBK |
| R8 | 10k trim pot 3/8" | 3386P-103 |
| R9 | 180k | 180000QBK |
| R10 | 50k trim pot 3/8" | 3386P-503 |
| R11 | 5k trim pot 3/8" | 3386P-502 |
| R12 | 4.7k | 4700QBK |
| R13 | 10k | 10000QBK |
| R14 | 68k | 68000QBK |
| U1 | 221-105 , ECG701, NTE701, SK9026 | |

# THE ULTIMATE SYNC DETECTO

| | |
|---|---|
| U2 | NE567, LM567CN |
| U3 | 78L05 100ma, LM78L05ACZ |
| 8 pin IC socket | ED3308 |
| 16 pin IC socket | ed3316 |

U1 is available from many suppliers including MCM Electronics, 650 Congress Park Dr, Centerville, OH 45459-4072, 1-800-543-4330



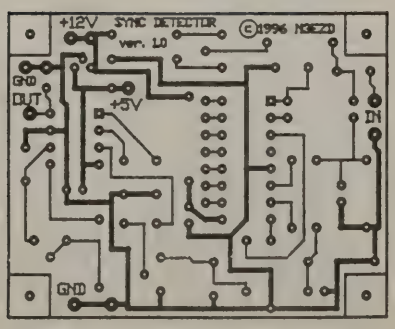




Figure 2.

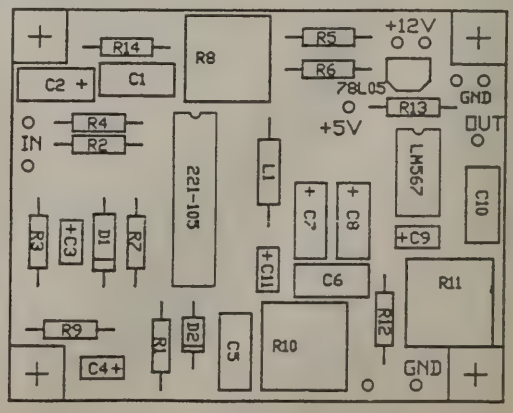



Figure 3.

# WEATHER SATELLITE SYSTEMS

from

## Spectrum International, Inc.

| | |
|---|---|
| PROsat II Display Sub System: | |
| Decoder Board and Software, Model TS-VGA SAT 4 | $249.00 |
| 137 MHz Receiving Sub System: | |
| Antenna, Model CY-137-2 | $109.00 |
| Low Noise Pre-amplifier, Model TS 137-P.Amp. | 65.00 |
| 137 Scanning Receiver, Model TS 137-Rcvr. | 299.00 |
| Orbit Predicition Programme, Model TS Track II. | 99.00 |
| Low Loss Coaxial Cable 65' with connectors fitted | 65.00 |
| | $637.00 |
| 1691 MHz Receiving Sub-System: | |
| Loop Yagi Antenna, Model 1691 LY"N" | $109.00 |
| Low Noise GaAs FET Pre-Amplifier, Model TS 1691 HEMT | 250.00 |
| 1691 Receiver, Model TS 1691 RCVR | 350.00 |
| Low Loss Coaxial Cable 65' with connectors fitted | 65.00 |
| | $774.00 |

The cost of a complete 137 MHz System is $886.00 ($249 + $637)
The cost of a complete 1691 MHz System is $1023.00 ($249 + $774)
The cost of the two Systems together is $1,660.00.

Demonstration Disc (IBM-PC VGA Compatible) of Signals recorded from wx-sat System are available for $3.
Shipping: FOB Concord, MA.
Prices subject to change without notice.

MasterCard

si

SPECTRUM INTERNATIONAL Inc.
Post Office Box 1084 Dept T
Concord, Mass 01742 U.S.A.
Phone 508 263 2145
FAX: 508 263 7008

VISA

# POWER AMP FOR 3.3 GHZ

BY HERU W3WVV

It seems that when the cross country network television was point to point on the ground microwave they used the same frequency that we now use for satellites. As I understand it the 6 GHz band went east and the 4 GHz band went est. When they went satellite 6 GHz was the uplink and the 4 GHz became the downlink.

This meant that the 6 GHz transmit equipment was still useable as well as the 4 GHz receive equipment. For various reasons the 4 GHz transmit equipment was nit useable on the bird and seems to be an orphan. It is being sold at hamfests and flea markets in the $25 price range for power of 3-5 watts as amplifiers. The drive requirement is 1-2 milliwatts.

Now I can just hear a lot of you saying "So what?" Now I will get to "so what." These amps were used for links across America and can still be used for links, the only thing is you have to tune them down or up to a ham band. The next one up from 4 GHz is 5.6 GHz. Forge that one it is out of the range of the transistors but down a couple of megahertz is the 3.3-3.5 Ghz band. You can almost always use a transistor at a lower frequency than it was designed for.

So if you tune it down it can be used for a number of projects. I will suggest uses later.

To tune it down, first the filter must be removed. They all have a filter to restrict the frequency to the 3.7-4.2 GHz band but different brands have different filters. The one in the picture had about a two inch long part of the output line with four 3/8" squares on it. If you buy one of these it also has circulators on the input and output that come apart when you open it up. Be sure to get the magnets in the right polarity or nothing will come out.

After you get the filter out it is time to start returning for 3.3 GHz band. You will need a signal generator for this band, a dummy load and a way to measure the power output. The way that I like is to use a directional coupler between the device and the load. The forward output from the directional coupler I feed to a spectrum analyzer that is calibrated for power levels. After it is tuned I make a more accurate reading with my power meter replacing the spectrum analyzer. I feel that the spectrum analyzer makes sure that I don't do something wrong and wind up with spurs on it or it takes off oscillating.

Nor for the "how to." I am not sure what all the theory is but to go down in frequency you add small tabs of brass or copper foil. All microwave transistors circuits are made and etched with extra tabs to set the in and out impedance to match the transistors and part of the tab is cut away for the desired match. To go down in frequency you increase the size of the tabs. A good way I have found is to make a series of small tabs from say, 1/16" square to 1/4" square and glue them on the end of Q tip sticks. Then take a middle size one and try putting it on the signal trace and moving back and forth on one stretch of either base or collector trace. It should make the output increase at one position. Try different sizes and find the size and position that makes the output maximum. Solder a similar size where you found maximum out. Next try the same thing on the rest of the base and collectors. After going back and forth you should be able to get the original power out at the lowered frequency.

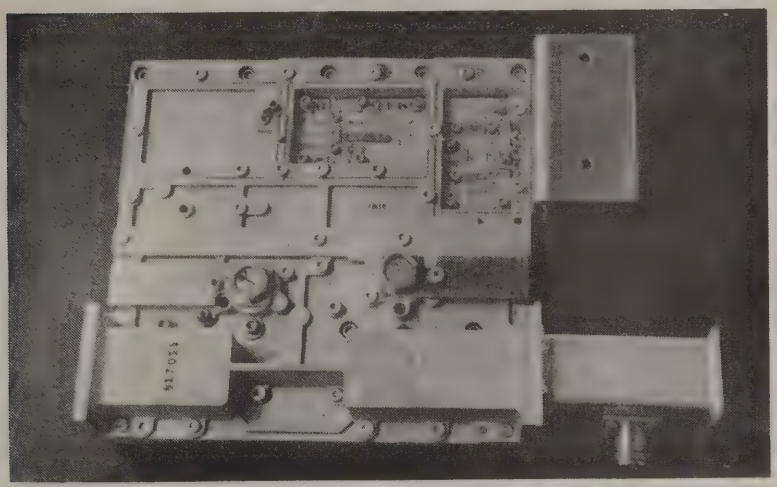
What do you use this for? It turns out that there are a l lot of the satellite receivers around that tune 3.7-4.2 GHz. These are television receivers with video and sound output. A lot of them will tune down to 3.3 GHz without modification. You just turn the tuning range pots and you have a receiver that tunes the ham band. Now maybe you begin to see where I am going with this.

If you build or buy an oscillator for this band that can be FM video modulated and puts out a couple of milliwatts, you can make a nice television link for a split site repeater or, if you make one of the collinear antennas I described elsewhere, you can make a TV repeater that would be easy to get a receiver for. A lot of people already have a 4 GHz satellite receiver and would only have to tilt their dishes over and change the tuning range. With several choices for an input frequency a good choice might be a microwave oven magnetron on 2.45 Ghz. Anyway I am not giving specific instructions for a use of the amplifier, just hoping to stimulate your imagination.

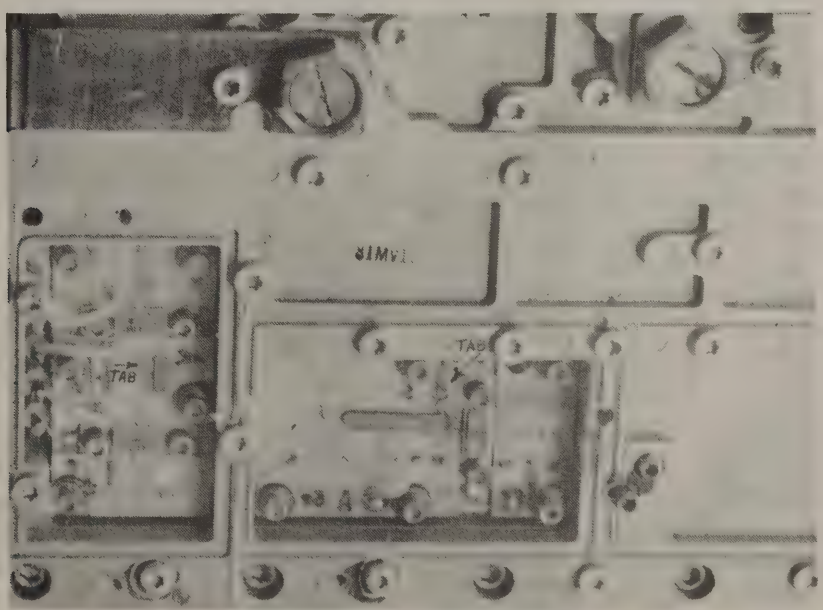
If you use one of these amps on anything, write it up and send it in. Have Fun, Enjoy Heru W3WVV

# POWER AMP FOR 3.3 GHZ

BY HERU W3WVV



This is a two watt version that I have tuned down to 3.4 GHz. Note one of my homemade coax waveguide transitions on the input. The other one was removed from the output to photograph for the waveguide article. The two very large screws near the end of the waveguides are holding the magnets for the circulator.




A close-up view of the amplifier board and transistors. Some of the tuning tab are indicated with an arrow. I had trouble soldering the tab to the substrate, it seems the substrate sucked all the heat away. I think it must be BeO. In any case be careful. The object that looks like the end of a popsicle stick is. It was an attempt to get around soldering the tabs. I glued the tabs to it and then glued it down. This way the tabs could make contact with the lines.

# INEXPENSIVE WAVEGUIDE

**BY HERU W3WVV**

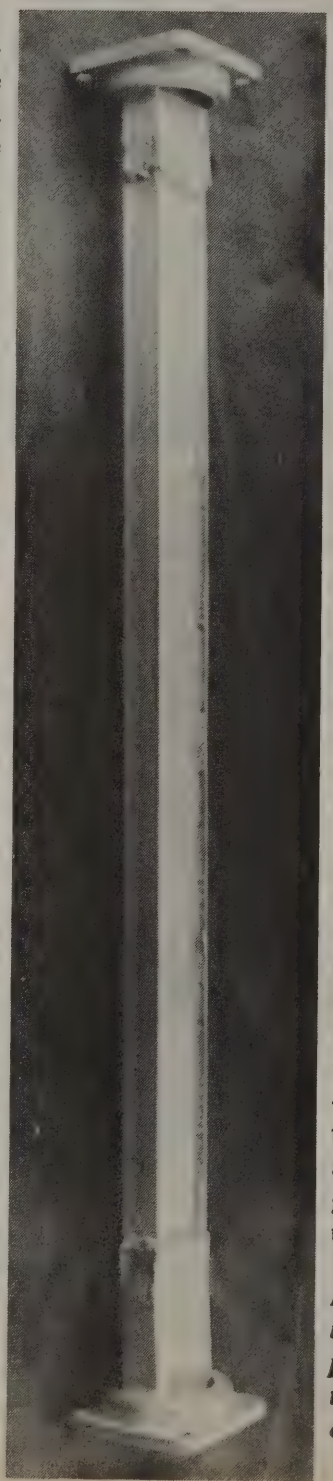
So you have just seen a microwave "how to" article that you would like to make. Maybe you had an idea for a project that you would like to try. The problem is that all require waveguide and waveguide is expensive! Well now there are ways of making waveguide that are downright cheap. In this composition I will give a number of ways to get waveguide to do your job very inexpensively.

The most inexpensive waveguide is probably the easiest to make. Say you want to make a X-band directional coupler. The materials required are a piece of one inch plywood (two half inch pieces glued together) several pieces of quarter inch or thinner plywood and some aluminum foil. Depending on your whim you may want some aluminum sheet, but let me explain.

First draw on the thick plywood how you want the waveguide channels to go. Then saw out the wood so that the channels that will form the inner part of the waveguide are open. Now flue aluminum foil to the surface that represent the inside of the waveguide. The foil should go over the edge about half an inch so that it makes good contact. Now glue aluminum foil to the surface of the thin plywood and nail it together.

You have a block of wood with channel through it that are the right size and shape to be a waveguide directional coupler. Since the microwave RF does not penetrate deeply into the foil the energy travels through these foil lined channels as if it were aluminum waveguide.

Next way to make a good usable inexpensive waveguide is to solder aluminum channel you buy at the local hardware store into rectangular tubing (read waveguide). It turns out that the channel they call edging for counter tops is square so that when you put them together the length to width ratio is 2:1. The most used ratio. Also the half inch channel when soldered into waveguide fits standard flanges for small X band guide.



A third way is to bend sheet aluminum to size and shape you want and solder the seams. I used this method to make some S band coax to waveguide transitions. I took a piece of 1/16" sheet aluminum four inches wide by a foot long and bent it around a hardwood block cut to size. I cut the ends so that they just meet in the middle of one of the long sides, and solder thee seam. A cover on one end and a flange on the other end completed the waveguide part. A hole drilled equal distant from each side and the covered end in the wide side without the seam made it ready to mount a coax connector and radiating element. They worked fine.

Another way is to solder two L shaped angle pieces together so that a rectangular tube is formed. By clamping them together first you can set the size you want. I used this method to make a high pass filter. It rejects 9.6 GHz totally and passes 9.8 GHz. Used with a circulator and gunnplexer it will down convert 10-10.5 GHz band to 450-950 Mhz. This can be fed into a spectrum analyzer using a UHF varactor tuner and not allow the 9.55 LO from the gunnplexer to the antenna. {Plans are to use a high gain radar antenna mounted in

***LEFT: Another waveguide project using L shaped pieces. This is a high pass filter. I sawed a short 'guide section in half and inserted the filter. An easy way to get standard flanges on it.***

my pickup. With my truck parked on one of the overlooks on Skyline Drive, I can scan both the frequency band and the azimuth to find signals. When I want to zero in on a signal I adjust the antenna for max signal and throw the waveguide relay over to my transceiver and try to work the station. I got his frequency from the spectrum analyzer. If I get this completed I will let you know how it works.

An article in one of the famous ham magazines several years ago was lamenting that waveguide for millimeter waves was so hard to come by and expensive. I had to laugh. Good hobby shops that carry model making supplies as part of that have brass sheet, rod and tubing. In the tubing they carry round, square and rectangular, in many sixes like 1/8" x 1/4", 1/16" x 1/8" etc. This stuff is sold in one foot long lengths. Now I won't argue that brass has less loss than silver, but it is low enough loss that it will work in most cases. It worst comes to worst, you can have your creation silver plated. I see adz for silver plating solution in these gift catalogs for around $15.

*ABOVE: A waveguide for 10 GHz, directional coupler made by lining wooden cutouts with aluminum foil. The lower flat board coated with foil is nailed to cover the RF channels. The black material at the end of the coupleled echannel is conductive foam sold to keep static from harming IC's but used here to terminate the opposite arm.*

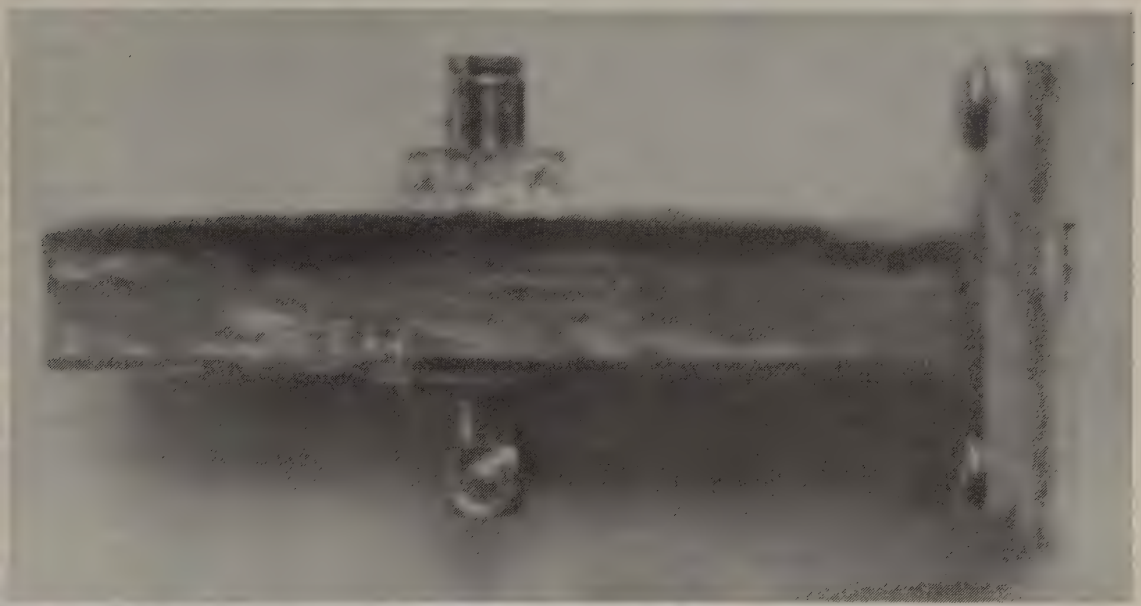
# INEXPENSIVE WAVEGUIDE

After making waveguide you have to connect it to things like antennas, mixers etc. A few words on flanges would be in order now. Choke flanges are nice if you can come by them but the losses from ordinary flat flanges are not all that great. So if you make flat plates of appropriate thickness (3/16" fir X band) 5/126" for S band) and sand or file them flat after attaching and drilling mounting holes, they are usable in almost all cases.

*TOP: X Band guide made from soldering two channels together. Note how it fits a standard flange. BOTTOM: A Coax to waveguide transition made by bending a sheet of aluminum around a block of hardwood and soldering the seam. The hole for the coax jack is drilled on the side opposite the seam.*

Now if you have a pet way of making waveguide for your microwave projects and there are more ways, that I haven't described write it up and send it in. If you don't agree with something I've said, write it up and send it in to Henry for publication, not to me privately. Maybe you think I missed an important point about waveguides, if so write it up for Henry so that all can see it. Have fun Heru W3WVV

# INEXPENSIVE WAVEGUIDE



*ABOVE: An X Band detector mount using the "solder two L shaped pieces method. It turns out that one of the pilot light bulbs is the same diameter as the crystal (1N23) so that it could be used as part of the mount. I used this style of making waveguide so I had a place to drill holes without having the hole cross a soldered junction.*

*LEFT: A transition from large S to small S. I made and bent to shape the four sides and then soldered the whole thing together. The flanges were cut from quarter inch aluminium. I used a coping saw to cut the rectangular holes and filed them to size. The bolt holes were match drilled with a mating flange.*

# TWO ANTENNAS

It is difficult to get high gain and wide bandwidth in an antenna. In this discourse, I will describe two omnidirectional antennas, one wide band and one with gain. Both are easy to make and are for UHF and microwaves. The only thing frequencies below 100 MHz are good for, is putting into the primary of a power transformer!

First, a biconal (picture opposite page) that is easy to make. Biconal antennas are very wide band and when vertically polarized are omnidirectional. One way to look at it is as a horn that the sides have been rotated 360 degrees.

To make one the easy way is to feed it with coax at the center. To start with, we need a strong piece of rigid coax. TO make this get a type N panel mount connector. Turn or file the flange to fit into the end of a half inch copper water pipe. Use a length of half inch water pipe long enough to extend out of the cone you make for the lower element. At this time you should decide what the lowest frequency you want to use. Make the altitude of the cone at least one quarter wavelength at the lowest desired frequency. The highest frequency will be determined by the dimensions of the throat. . OK, after you get the copper water pipe of the proper length and the coax fitting to fit the end, get a piece of quarter inch tubing about a quarter wavelength longer than the half inch water pipe. As an aside, if you go through the math this combination gives an impedance what is less than an ohm from 50 ohms. It turns out that water pipe is measured from the inside so that half inch pipe is a little over a half inch ID. Tubing is measured on the OD and is not made oversize as pipe is so that

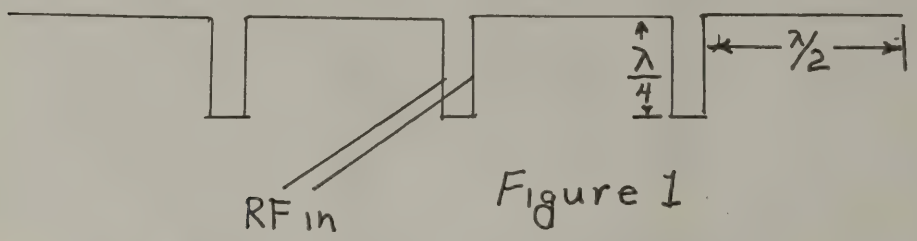



Figure 1

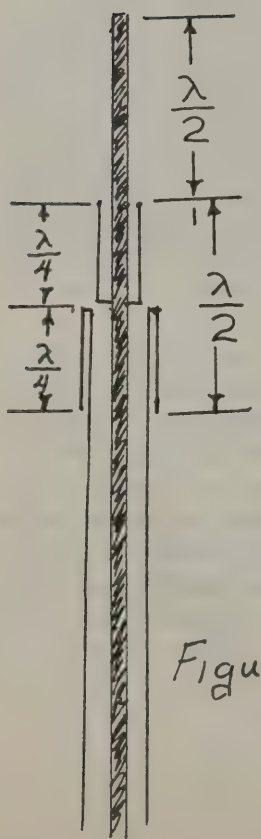



Figure 2

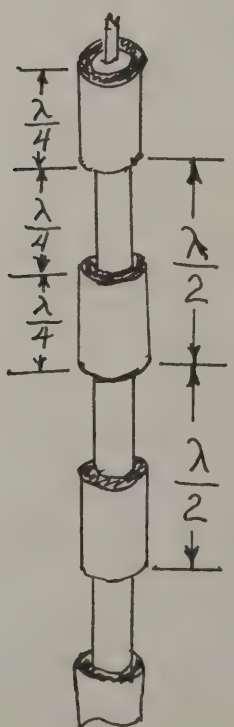



Figure 3

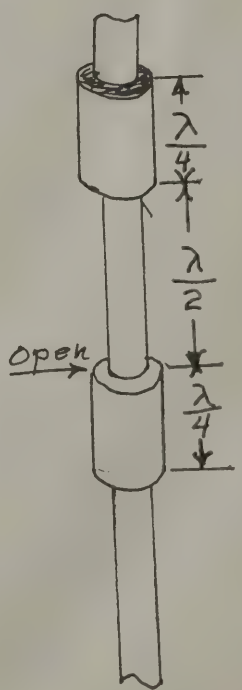



Figure 4

inch tubing is one quarter inch plus or minus a very small tolerance OD. Measure the pipe ID and the tubing OD and plug the numbers into the formula, you get something very close to 50 ohms. [Ed 51.5]

Now solder the small tubing to the center pin of the connector and solder the connector into the pipe so that you now have a connector on the end of a piece of rigid 50 ohm coax. To keep the center conductor centered, cut a washer from nylon or teflon and install it on the open end. Seal this washer with RTV. Also drill several #50 holes as close to the connector as possible. I have learned that it is impossible to seal out the weather. One time I had a downconverter that I sealed with RTV in a diecast box. About a year later it quit. I took it down and opened it up. It was half full of water! That taught me to always drill a small hole at the bottom of any container exposed to the weather to let the water out!

Anyway, you now have the basis for several antennas. For a biconal get heavy wire (10, #12) and bend an inch or so to make a 90 degree hook. Solder these around the half inch pipe on the opposite end from the connector. Use at least six and 8 is better, spaced evenly around the pipe. See the picture. Do the same for the center conductor. After soldering the elements bend them to the angle desired. The angle between the two cones is hard to figure for maximum effect.

# TWO ANTENNAS

I have been unable to find any simple formulas to help you decide. I have found about 100 degrees works fine for me. A ring of wire fastened to the end of the wires forming a cone and if desired, fastened to the center conductor at the top.

I use this on my homemade spectrum analyzer. It uses a VHF varactor tuner and the antenna covers the range nicely. I described the spectrum analyzer in an ATVQ issue a few years ago (see index in this issue)

The other antenna I will describe is a different way to mechanize the collinear antenna, see figure on the first page of this article.

This is a vertically polarized omnidirectional antenna that has gain. Gain is determined by the number of elements. This antenna is easy to make for any UHF or microwave frequency. The quarter wave stubs are folded onto the surface of the antenna. This makes it symmetrical about the axis of the coax and thus omnidirectional about that axis. Now mount it with the axis vertical and you have an omnidirectional antenna in azimuth that also has gain.

To get this gain, we have to add elements to the center fed half wave dipole. By keeping the coax running up the center of the antenna all elements must also be coaxial. Let us start with the element the feed is attached to (fig 2). Each piece of the half wave element is made from tubing of a size that will allow an air space between the outer conductor of the coax that is large enough not to arc and not to touch with changes in temperature and yet small enough so that it still looks like a quarter wave element. I made an antenna using UT141 hard line for feed.

I made the elements our of quarter inch copper tubing. The way I made the end necked down to fit on the hard-line was to swage it down with a modified tubing cutter. I took the wheel out and replaced it with a flat washer of the same diameter. Now instead of cutting it just dents it in all around and after getting to be a tight fit over the coax I sawed it off on the edge of the swage. It could now be positioned and soldered in place. This is not the sequence I put the antenna together in but it makes it easier to understand if the explanation starts here.

For the second element on the shield of the coax another quarter wave piece of tubing is a quarter wave from the open end of the first. See figure 3. The quarter wave of bare coax shield plus the quarter wave of the outside of the outer tubing make a half wave radiator with the inside of the tubing and the coax forming a shorted quarterwave stub to give a 180 degree phase shift to keep all the half wave elements in phase. To make more elements on the coax shield, repeat the last step.

The last element has to be ended in a different way. If a definite end is nor used, RF will be on the outside of the coax. A way to end this is to leave a half wave of shield as the last element and use another quarter wave stub only turn it around so that it isolates the end of the last halfwave element from the shield. See figure 4.

Now for the center conductor. It is done in a similar manner but using smaller tubing and at the end, since the center conductor stops you do not need the final quarter wave stub. First use a quarter wave piece of tubing over the center conductor to make the half wave element then leave a quarter wave of center conductor open followed by another quarter wave stub arrangement. After you have the desired number of elements end by just leaving a half wave of center conductor open. See figure 5.

The antenna in the photograph is the one I made for the 3.3 GHz band. I am making an experimental 3.3 GHz transmitter using the same format as the satellites. I started with a type N connector with 18 inches of UT141 hard-line fastened on the end. I will admit that when I figured the length of the quarter wave sections and made the antenna it resonated 50 MHz lower in frequency than I calculated.

If you make one of these antennas write it up and tell of your luck with it and send it to Henry to be published. If I said something you disagree with don't write me, write to ATVQ and let Henry publish it. Have Fun Heru W3WVV. PS. If you try to put the second antenna in PVC pipe as a weather proof enclosure, be sure to check the plastic pipe in a microwave oven. If it gets hot don't use it!

# IN RESPONSE TO: A REQUEST FOR INFORMATION ON ALLOTMENT CHANGES FOR 70 cm. AND ABOVE AMATEUR FREQUENCIES PREPARED FOR THE TEXAS VHF-FM SOCIETY THE NORTH TEXAS SYNCHRONIZATION CLUB (NTSC) MESQUITE, TEXAS

## Responding to a request for information:


Billy McDonald, KC5NQ
President, NTSC
910 Villa Siete
Mesquite, Texas 75181-1236

John Holmes, WA5WXA
Vice-President, Advisor, NTSC
725 Laguna Drive
Garland, Texas 75043


To:

Ed Manuel, N5EM
Board of Directors,
Texas VHF-FM Society
10430 Sageville
Houston. Texas 77089

Paul Gilbert, KE5ZW
State Coordinator,
Texas VHF-FM Society
1911 Pleasant Street
Huntsville, Texas 77340

Gentlemen:

Please find enclosed several graphs. The first four are depictions of the existing ARRL band plans for 70 cm., 33 cm., 23 cm., and 13 cm.. The remainder are proposed plans for the same bands and suggestions for 3.3-3.5 GHz., 5.65-5.9 GHz, and 10-10.5 GHz. Hopefully the graphics showing the proposed allotments are not too confusing, but are an effort to graphically depict the proposals. One of the efforts was to adjust the band plans in reference to ATV. In the band plans generated by the ARRL, the audio subcarriers were apparently not taken into consideration. This may be a leftover from the days when just getting a video signal on the air was enough of a challenge, or taking into consideration some of the programming seen on network television, a purposeful move. But, with the advances made in the electronics field in the last several years, creating and detecting the audio subcarrier is quite easy, and is quite advantageous since the receiving station does not have to incorporate an independent radio to receive the accompanying audio.

Never having had to use 'Carson's Rule', as mentioned in Tom O'Hara's (W60RG) letter, the correctness of his calculations for visual and aural signal bandpass are unknown, but they do seem a bit large. These figures appear to be somewhat correct for use in satellite F.M. TV signals where high quality video is a requirement by the satellite users. In Amateur Television, network quality video is a challenge not a requirement. At the present time in the Dallas area, 4 MHz. video is being transmitted by F.M. on 915 MHz. into the ATV repeater, with a 5.8 MHz. audio subcarrier, and has excellent results on the A.M. output. Generally, the bandwidth of the transmitted visual signal on 915 MHz. is 8 MHz., this of course depends on the video drive level at the transmitting station. There are available F.M. ATV transmitters and receivers for operation in the 1.2 GHz. and 2.4 GHz. bands that function quite well with a 12 Mhz. bandwidth. Therefore, it is suggested to adjust the band plan for 33 cm., 23 cm., and 13 cm. to allow F.M. ATV operation, with aural subcarrier, for at least a trial period, to see if 1) the available equipment does perform as advertised, and 2) the adaptation of the expanded allotment is conducive to the adjacent modes of operation. It is possible that the l2 MHz. bandwidth of the above mentioned units will work, but, it is also possible that the 12 MHz. bandwidth does not provide for an acceptable received video. If it does work, reallotment of the upper bands could very possibly be easier and could have less 'controversy' from other users of the same bands.

# *NTSC PROPOSED BAND PLANS*

In reference to the Mid America Coordination Council (MACC) decision to 'eliminate ATV from the 70 cm. band', this opinion was heard during the meeting of the Texas VHF FM Society at HAMCOM. This announcement was not taken lightly. This type of decision might have more repercussions than MACC, and the Texas VHF FM Society, is ready to accept. To be noted, there are several ATV 'machines' around the country that provide weather radar to the general public, including municipalities that do not have access to any type of radar. Telling these municipalities that they will have to 'junk' the equipment they now posses and will have to purchase even more expensive equipment, to include a fairly expensive antenna and 'better' coax, will probably not set very easy with them and will not put Amateur Radio in a very good light. The progress made between the Amateur Radio community and the city governments has been very good in the last few years. To mention a few: The earthquake in California, the hurricane that hit southern Florida, and numerous local activities. Limiting this mode, with its' present ease of participation for Amateurs and the general public alike, will be a mistake.

With the current level of technology, using different modes of operation on the higher bands i;, easier. This is a direct result of devices made available through technological advances in numerous fields in the commercial market. With more and more of these devices and their associated technology becoming available, communications modes and the frequencies made accessible will ultimately increase, both in the commercial and the Amateur arena. This advancement should not be a justification to eliminate a mode of operation in any part of the R.F. spectrum. With advancements in available equipment and parts, and prices actually becoming affordable to the average Ham, 'older' technology should be the one to 'take the back seat' if any limitations should *have* to take place. Making an effort to subdue advancements in the hobby is contrary to the creed of The Amateur's Code, as stated in every ARRL HANDBOOK: The Radio Amateur is: PROGRESSIVE.. *with knowledge abreast of science*.. And in reference to MACC: CONSIDERATE never *knowingly operates in such a way as to lessen the pleasure of others.* (Paul M. Segal, W9EEA, 1928) It really looks like the decision of MACC to eliminate ATV operations in the 70 cm. band is an intentional effort *to* lessen the pleasure of others and *limiting* Hams who desire to learn more about the hobby. This decision will do nothing but cause harm to the hobby.

These and other actions taken by 'coordinating' entities should be monitored very closely. The current agendas taken by most of these entities have the 'aroma' of being an effort coordinated by a select few whose main purpose is not in the best interest of the Amateur community or the hobby in general. Specifically, allowing 'links' to operate carte blanche on almost any frequency that is deemed appropriate. For some reason, the majority of these 'links' seem to appear in the passband of existing ATV repeater outputs. Why don't they appear in the weak signal areas? Or in Packet allotments? Looks very suspiciously like a determined effort to make ATV unusable. One area that seems to have been overlooked is what are the possible affects of the effort at hand? To be noted: almost every division of the U.S. Government has experienced 'down-sizing'. This 'down-sizing' has even affected the F.C.C. With less people doing more work, the people doing the work prefer that their work be less complicated. In the last few years the number of complaints received by the F.C.C. about Amateur Radio has increased. Is it not entirely possible that the 'quickest' solution to this 'Amateur Problem' is to eliminate the cause of the problem? Do *we* really want to put our licenses and our access to the hobby 'on the line'? *We* are supposed to be a self-governing body. If all that *we* can do is squabble over differences and make a concerned effort to 'disrupt' others use of the hobby because we can't get our way, then we need to STOP, and take a look at the WHOLE PICTURE. Anyone that has had children around should be able to recognize this picture, and the F.C.C. has a REAL GOOD belt.. Now all that's left is to figure out WHO it is that has to 'grab their ankles'. Those that are trying to conform to the rules probably won't 'get their licks', but will most definitely 'feel the results'. In fact, everyone is going to feel the results. There is enough spectrum for everybody, maybe not as much as each person wants, but there is enough. If there doesn't seem to be enough space to do what you want to do on a specific frequency, guess what....there's other frequencies out there! Other bands! If one persons activities with a certain mode cause problems for others, why eliminate that mode? Are we so close-minded that we

refuse to even help those that want to do something different? If we can't try to work out problems, if we can't make even the most minor effort towards figuring out why there are problems, then maybe we ought to digress back to the spark-gap and let it go at that. Science is not going to stop just because of a few problems. Did Single-sideband work the first time? How long did it take to make Packet work? How about the first phone-patch? If a mode works well somewhere, why isn't that operation investigated? If a mode doesn't work well somewhere, why isn't that operation investigated?

The modus operandi of the coordinating committees around this country need to be changed to a concerned effort to NOT eliminate modes of operation and to promote MORE modes of operation. Think about it. If we can't handle what we have, how can we handle any more? Let's not blow it. If frequency segments can be allocated to allow as many modes of operation, or MORE modes of operation in the same amount of spectrum, and allow as many, or more, operators in these allotments, shouldn't that at least *look* like we can handle our own hobby? Agreed, there are going to be a few 'losers' per band, but if the allotments are scrutinized very closely, the 'losers' of one band can be the 'gainers' of another. Through a lot of 'back-door diplomacy' the Amateur has LOST a tremendous amount of spectrum. If we keep this bickering stuff up, we are going to loose more. Those with connections in the commercial 'communications' area should be quite well versed on this. Motorola, Erikson, and others are gearing up to 'demand' the F.C.C. turn over 900 MH□hz. to 1.4 GHz. to them. The whole enchilada! 220 to 228 MHz. is now so full of Spread Spectrum that its' usefulness is going to become questionable very quickly. If we continue to be a 'sore spot' with the F.C.C., they WILL solve the problem. Let's not throw out the baby with the bath water!

There have been numerous 'opinions' about ATV bandwidth. Everything from massive calculations to 'it can't be done in less than ....'. This subject seems to be similar to the 'bumble bee' story where tremendously educated scholars determined that the aerodynamics of the bumble bee prevent it from flying. Don't tell the bumble bee! How does this relate to ATV? Well, the builders of the 421.25 MHz. ATV repeater in Dallas *didn't know it couldn't be done. So*, in a uneducated manner, a mission was embarked on to build (actually rebuild) an ATV repeater. This effort was aimed at constructing the best machine possible using the best available, and affordable, parts. The results are self explanatory. The output of the repeater conforms to commercial television transmission specifications. as stated in 47 CFR 73.682 (a), which IS the requirements for ATV, reference 47 CFR 97.119 (b)(4). The output resides within 6 MHz. of spectrum, including aural subcarrier. The input, 915 MHz. at present, responds quite nicely to a 8 MHz. wide, plus aural subcarrier, signal. So far, no complaints are known to have been made in reference to the repeaters operations, except to the interference affecting the input to the repeater. To be noted, it took approximately 5 months to get everything operating acceptably before it was put on the air. The parts, pieces, and methodology used in the repeater are the same as used in commercial television stations. We cheated.

There are a few ATV repeaters around that don't conform to the same standards used in Dallas on 421.25 MHz., and there seems to be some problems associated with them. If the operators of these repeaters were to put a similar effort into their repeaters, the problems would decrease. If they need help to identify problems, it is available. If these repeaters do conform, then there are other parameters associated with the problems. All parameters need to be considered, not just one.

What needs to be done? First, let's compare. The 'problem' that has caused the most concern is FM Voice Systems vs. ATV Repeaters. Narrow Band FM (NBFM) 'systems' have been around for quite a while and numerous lessons have been learned. ATV Repeaters have not been around that long, and there are still lessons to be learned. If a Ham desires to put a NBFM repeater 'on the air', there is more 'advise' available than a single human being can write down in a lifetime! If a Ham wants to put an ATV Repeater 'on the air', lots of luck! Still, there's a bunch of free advise, and it's worth every penny of it! Yes, there is at least one magazine devoted entirely, for the most part, to ATV. But, where does one go, without having to wait 2,3, or 4 months for a reply, to find out: Why is the circula-

tor is so hot? Why is a circulator needed? Why does the aural subcarrier go-away when I install the circulator? Why does the transmit power drop when I install an Interdigital Filter? Some people have found out the 'hard way'. Do they desire to keep this information to themselves? Definitely not. Is there a group one can ask questions of to get an answer? Not really. Can this be the problem? Not trying to 'point fingers', but he who makes the rules needs to be able to explain how to abide by the rules. i.e., if a group is going to coordinate activities, they need to be able to explain to the people who desire to participate in these activities how these activities are done. So, before we shoot the horse because we *think* it has a broken leg, let's take a good look at what is actually happening. The solution could be as simple as a realignment of a piece of equipment, replacing a piece of coax, or an explanation of how something should be done.

Now to the enclosed band plans. With reference to the band plan for 70 cm. Since there are repeaters coordinated and operating in the 442 to 445 MHz. area, re-allotment of 438 to 442 MHz. seems sensible. The proposed change could create 198 5-KHz. channels (see chart). If these 'channels' were divided up in assignment to something similar to the quadrant method illustrated on the chart, 696 'channels' could be in operation without 'interfering' with any other mode or each other. Adding the 438 to 439 MHz. and the 441 to 442 MHz. segments with 100 10-KHz. channels each, the total then becomes 896 simplex/link channels. This should take quite a while to 'use up'. The loss of 'ATV channel 3' should not be much of an inconvenience since the 439 MHz. ATV allotment is almost useless for ATV purposes at the present time. The remainder of the 438 to 445 MHz. 'chunk' can then be allocated to other modes. The assignments shown on the chart are an example, but does not take into consideration those Hams who like to experiment with 'new' modes. Also note that there are 'directional beacons' shown. This was an idea originating from discussions of beacons with several people who are into the propagation thing. Having a known source to listen for is nice, you can get good information about the prevailing propagation this way. But, a 1 Watt beacon can only be heard so far under a given set of conditions. If a beacon is a directional 1 Watt, it can be heard farther in a certain direction.

Wouldn't hurt to let the 'prop' boys try it.

**23 cm. band.**

There may have been some 'good intentions' in the WARC effort, but they apparently didn't ask very many Hams very many questions. The 1260 to 1270 MHz. chunk of spectrum they 'reserved' was probably a result of these 'good intentions', but has left a lot of questions: 1) What can one DO there? 2) Where does one do it? 3) Is there a calling frequency? 4) Who has 'priority' in this segment?, etc. Numerous people have been asked about the WARC reservations. Most are aware that there are areas 'reserved' by WARC, but not much information is available as to what can be done there. So, for the sake of simplicity, let us ignore this 10 MHz. chunk of the 1.2 GHz. band for now.

With the 'normal' split for 1.2 GHz. repeaters being 20 MHz., vs. 12 MHz. as the ARRL band plan indicates, moving the repeater outputs from 1282 through 1288 MHz. to 1290 through 1294 MHz. matches the inputs. This 'looses' 2 MHz. of the input and output, but leaves 160 pairs for repeaters.

Reasoning: 23 cm. is not like 2 Meters. 23 cm. is definitely 'line of sight'. The R.F. horizon is similar to 2 Meters, but the actual 'talk distance'. in reference to mobile to repeater operation, is quite a bit shorter. Plus, available transceivers at the present time are running only 10 Watts max., which limits THEIR range of operations. Manufacturers are a bit 'queasy' about making available higher power levels since the term 'bug catcher' will be replaced with 'bug zapper' at power levels approaching or exceeding 50 Watts. This decrease in usable operating range can allow for positioning of 1.2 GHz. repeaters in a closer proximity than 2 Meter or 70 cm. repeaters.

The 23 cm. proposal specifies 'ATV channel 1' as A.M., channels 2 & 3 as F.M., and widens the FM channels to 12 MHz. The 1246 to 1248 MHz. point-to-point segment has been moved to 1299 through 1300 MHz which allows for 40 25-KHz. channels. The Digital segment is shrunk a bit, but has 2 additional segments, one above the allotted repeater inputs and one below the allotted repeater outputs, along with Digital Control and WBFM Experimental. Two 750 KHz. segments are added above the A.M. ATV slot for WBFM and Digital which could be changed to point-to-point.

For 13 cm., the ARRL band plan indicates the low end dedicated to Weak Signal, EME, Repeater Inputs, and a large amount of Digital allotments. Digital

# NTSC PROPOSED BAND PLANS

seems to be the way of 'the future', so let it stand. The upper end of the 13 cm. band is also quite well appointed with Digital allotments. The proposal indicates a number of the Digital allotments suffering, but leaves in the Satellite sections, though reduced a bit. The ATV allotments are 14 MHz. wide. This allows for equipment development and learning curves, since there is minimal ATV activity in this area at the present time the equipment developed for use will most probably not be as Narrow' as desired in the beginning. As the equipment and methodology evolve, the required bandwidth should decrease, which would make more spectrum available for other modes. Being as though an A.M. signal will most definitely take up less spectrum than an F.M. signal assigning a second A.M. Repeater output on the 'upper end' will make up to 6 MHz. available for other uses on an area by area basis. If, as an example, a second A.M. output is coordinated in Austin for ATV channel 2, 2,417.5 - 2430.5 MHz., point-to-point channels could be used between 2425 and 2430.5 MHz. with 220 25 KHz. channels being made available. To make things even better, as far as audio quality for these channels, dedicate this area Wide Band FM (WBFM) and make the channel spacing 50 KHz. That would allow for 110 WBFM channels with deviation up to 35 KHz. That might even make 'talkies' sound like a real radio!

One thing to be taken into consideration is that these channels not be allowed to be used in an area or for ingress/egress through an area that uses the channel for FM ATV. The method of assignment for these areas should have ATV as the primary user and voice secondary with voice assignments 'backing into' the segment allotted for ATV. One characteristic of this band, and others above 1.2 GHz., is that omnidirectional operation is not generally an acceptable practice since anything between two stations absorbs the R.F. and limits operations to line-of-sight. On the other hand, since the antennas for these bands are small, high-gain directional beams are very unobtrusive and make for excellent point-to-point links with acceptance of other signals limited greatly. 30 elements on 2.4 GHz. is shorter than 5 elements on 70 cm, has more gain, and is easier to climb a tower with.

Also to be noted, the F.M. assignments are generally for INPUTS to a repeater. Therefore, the use of these channels is directional and should pose little, if any, affect on nearby operations. This is not say that there will never be any requests for F.M. outputs, but using the A.M. mode for an output is the easiest method for people to receive an ATV signal. F.M. signals, being the more difficult to demodulate, especially for ATV, require more of an investment than some are willing to spend on a just-want to-see basis. F.M. outputs should be available, for the 1.2 GHz. and above bands, for those that desire to experiment with this mode.

This effort to reorganize the 70 cm. and up Amateur Bands is aimed at alleviating the problems that have been arising in the UHF part of the spectrum and to try to create allotments that will allow as many modes of operation as possible. If we can create a busier spectrum in the allotted space, with fewer problems, we might not be 'First on the list' to loose spectrum when the big boys 'need' some more play space.

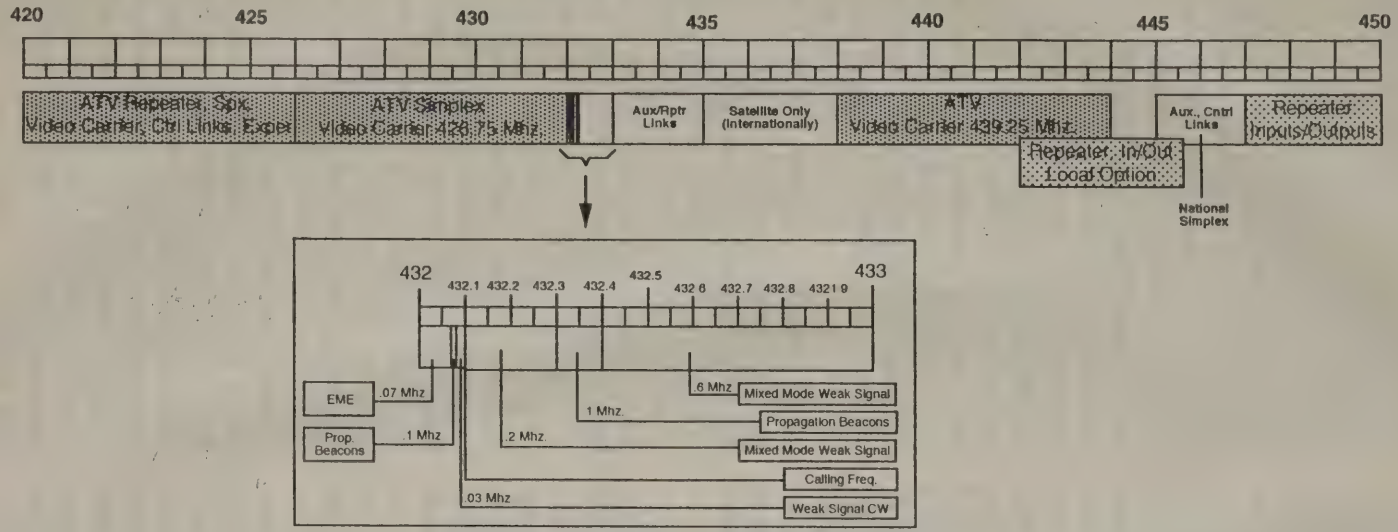
Billy McDonald, KC5NQ John Holmes, WA5WXA

***diagrams on following pages>>>>>***

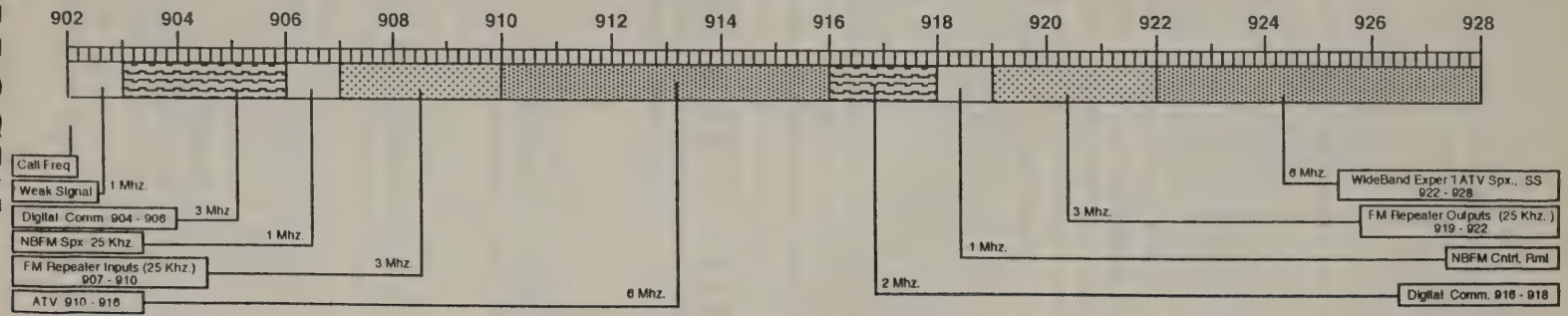
# GUNNPLEXER NOTE

One problem with running Gunnplexers on 10 GHz ATV is temperature drift. I just finished checking out the heater kit from SHF Microwave and it works great. I ran my Microwave Associates Gunnplexer with the heater and ran a frequency vs time plot on it. I think the 10 minute preheat warm up from 70F to the 115-120 degrees as a suggested wait time is more than enough. Mine went down 3 MHz 5 minutes after turn on and stabilized at -5 MHz after 10. It was easily reset with the bias pot on the P. C. Electronics GVM-1 Gunnplexer video modulator from the initial 4.0 V to 4.8 V to get back on 10.400 GHz. This was all on an open bench, so if put in an enclosure with insulation, it should be even faster. The heater circuit initially draws 1.5A at 13.8 on turn on, and dropped down to below 50 ma once stabilized. There is no easy way to get around the initial turn on frequency change of the Gunn diode itself it seems. Mine decreased 5 MHz in 20 seconds and settled at -6 MHz after 60 seconds. Maybe it is a good idea to wait half a minute to think about what one is going to say or show, Hl! For 11 MHz deviation ATV I don't think it is a big deal, but for 4 MHz or voice modes it might. At any rate the heater takes the long term frequency drift out of the picture (pun intended). I recommend the $20 SHF Microwave heater kit (arutz@shfmicro.com) to anyone intending to mount a Gunnplexer outside for an ATV link or transmitting to a repeater. 731 Tom O'Hara W60RG

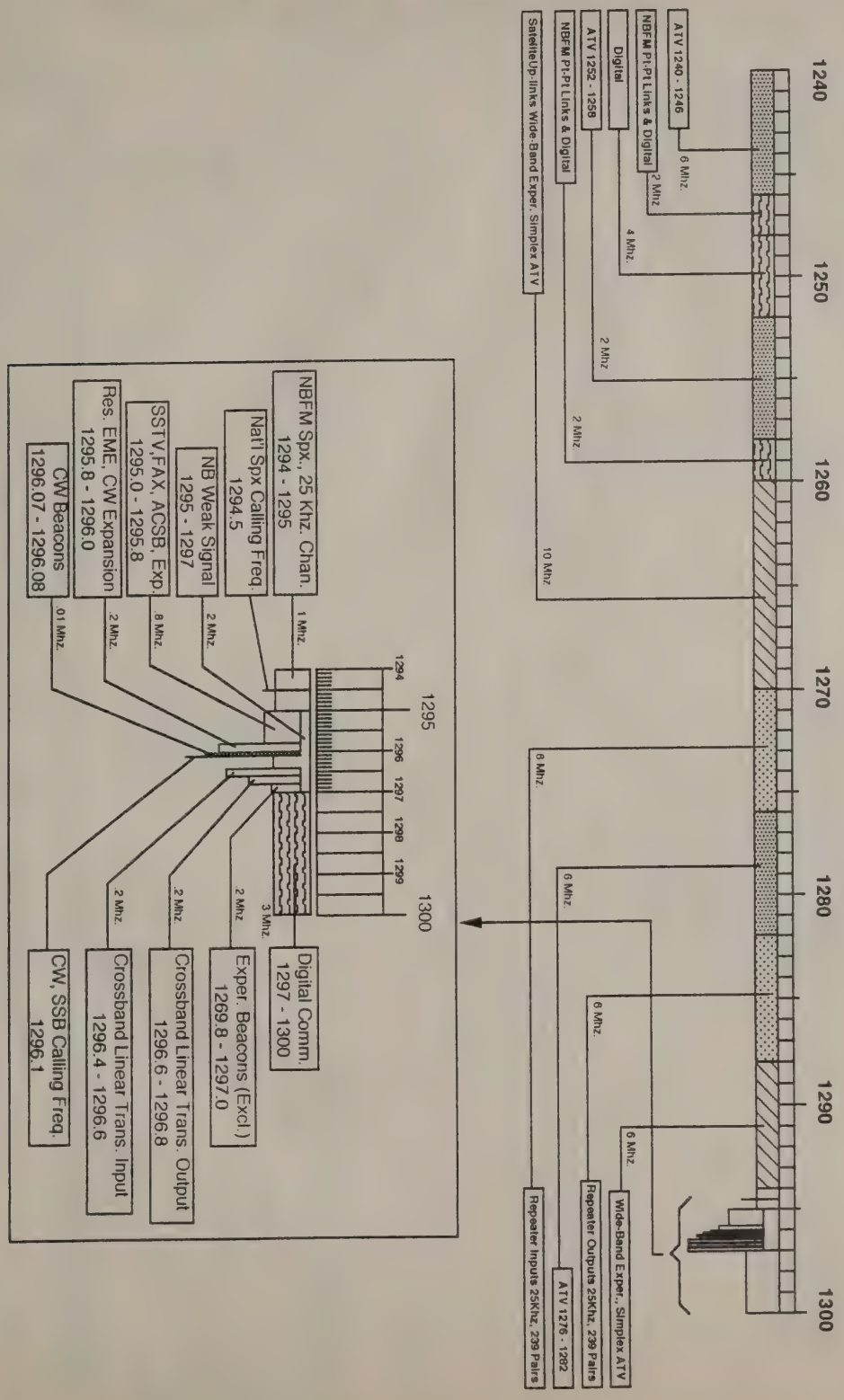
## ARRL 70 cm. Band Plan
## 420 - 450 Mhz.



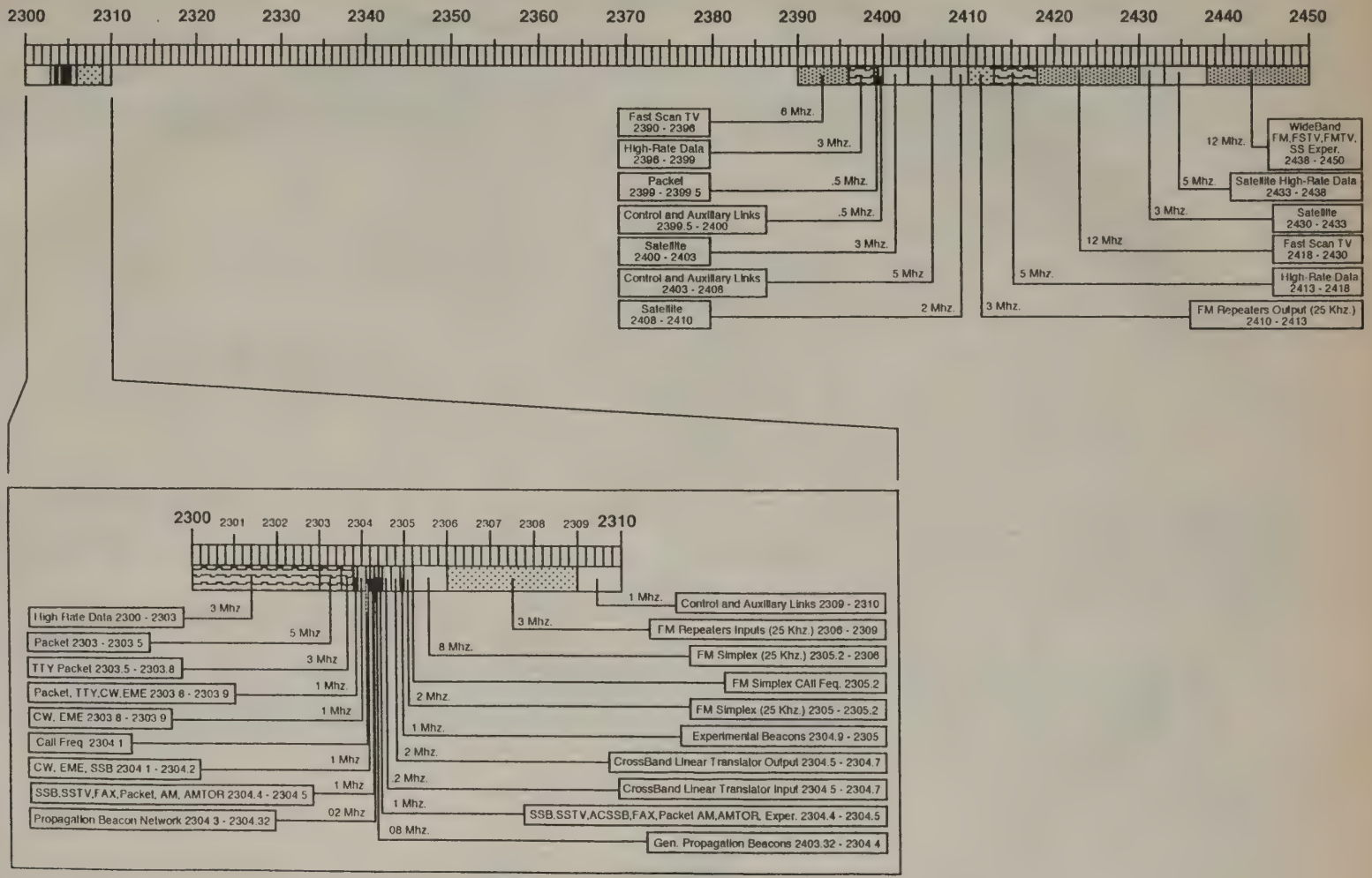

## ARRL 33 cm Band Plan
## 902 - 928 Mhz.



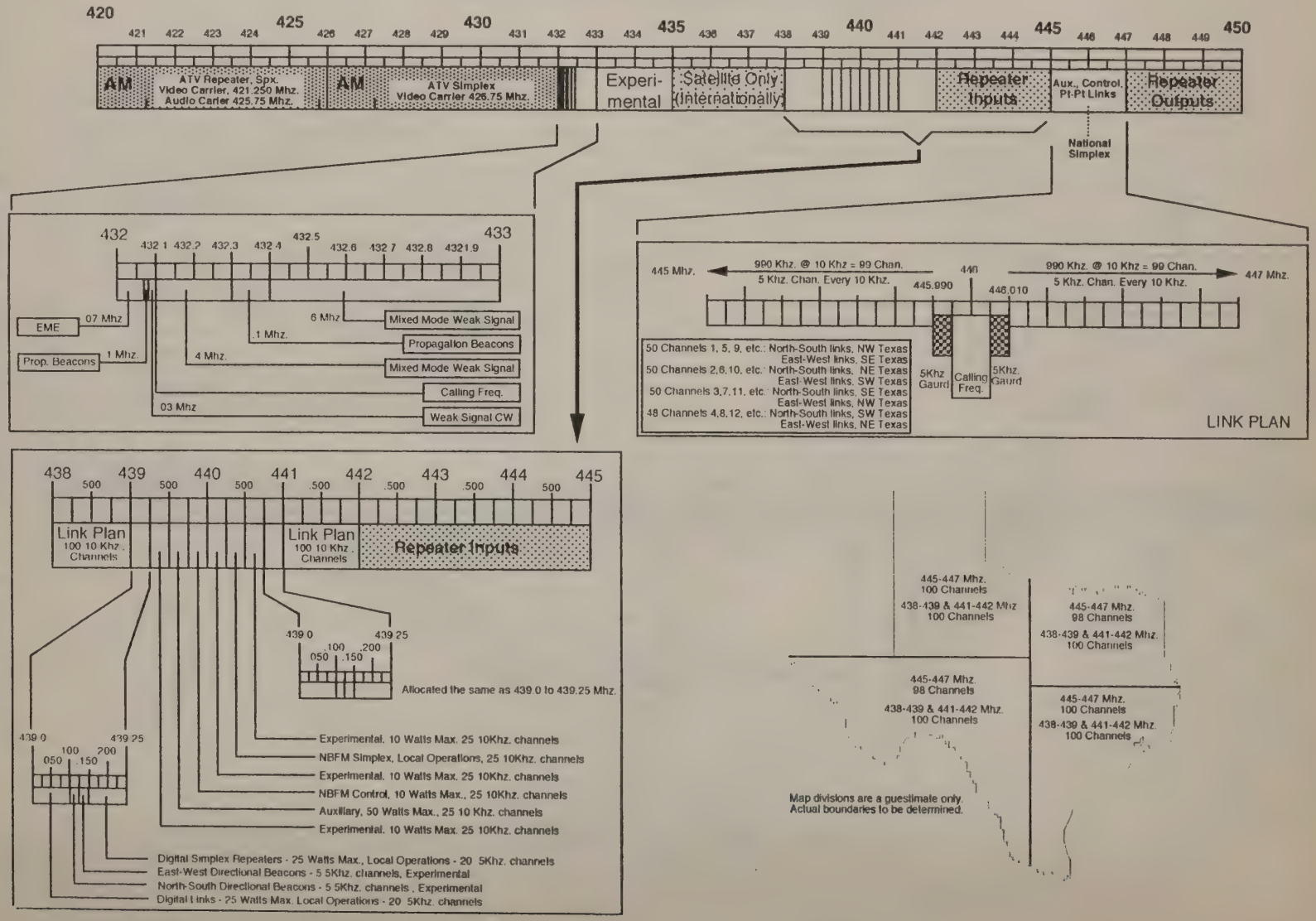
# NTSC PROPOSED BAND PLANS



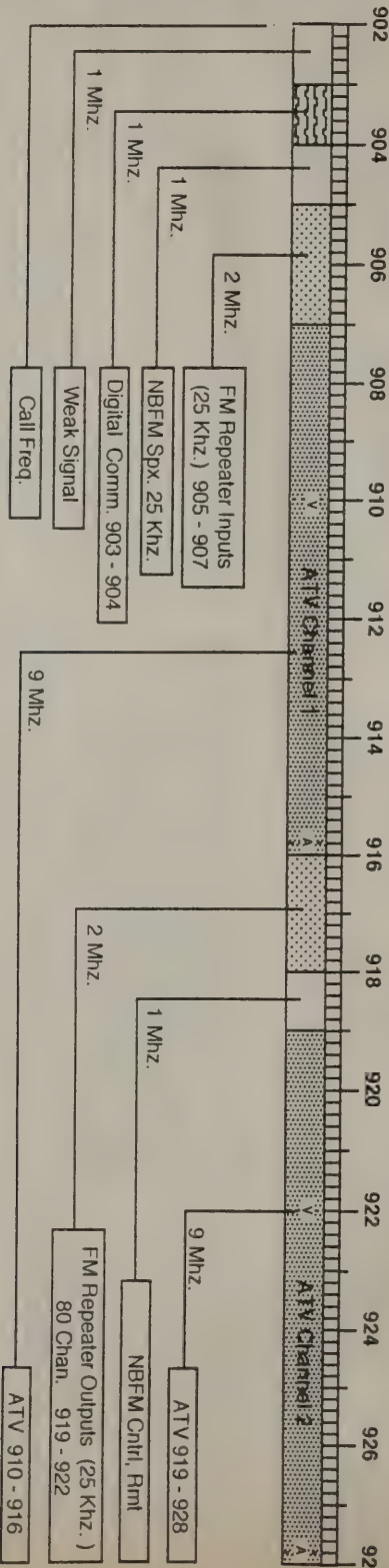
# ARRL 13 cm Band Plan
## 2300-2310 and 2390-2450 Mhz.



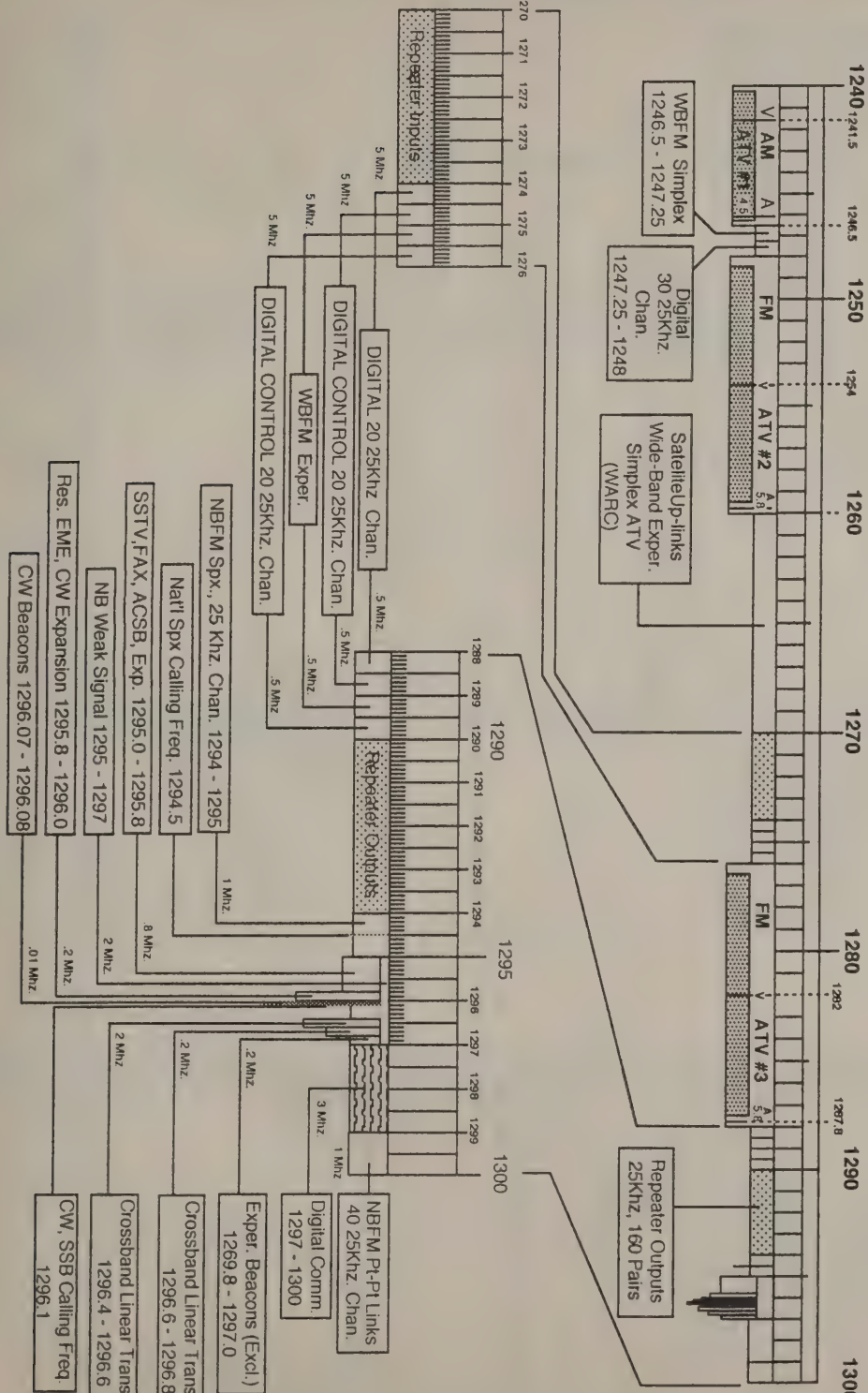
# PROPOSED 70 CM. BAND PLAN.



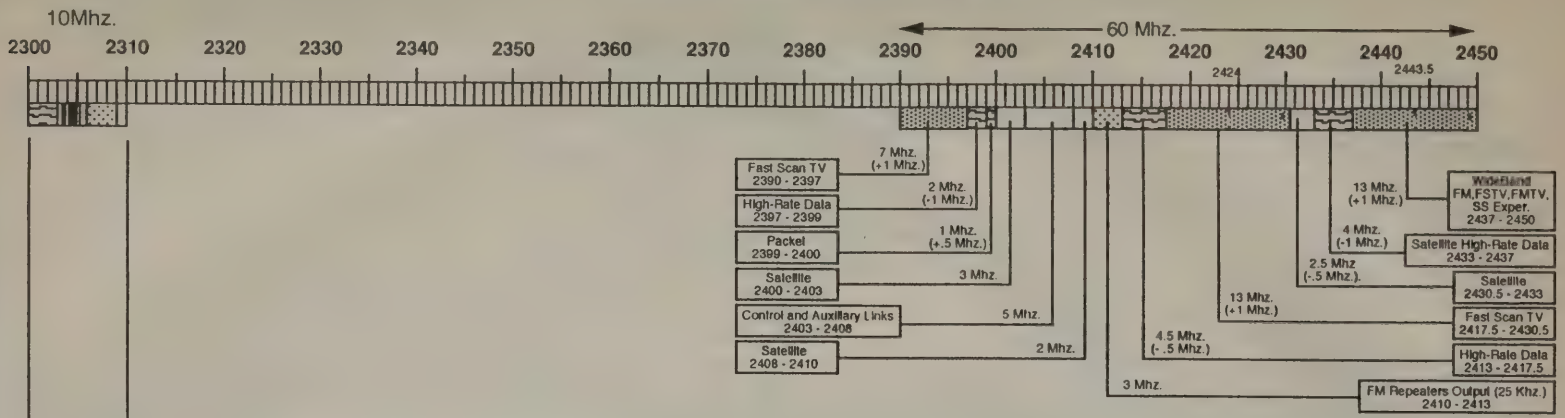
# NTSC PROPOSED BAND PLANS

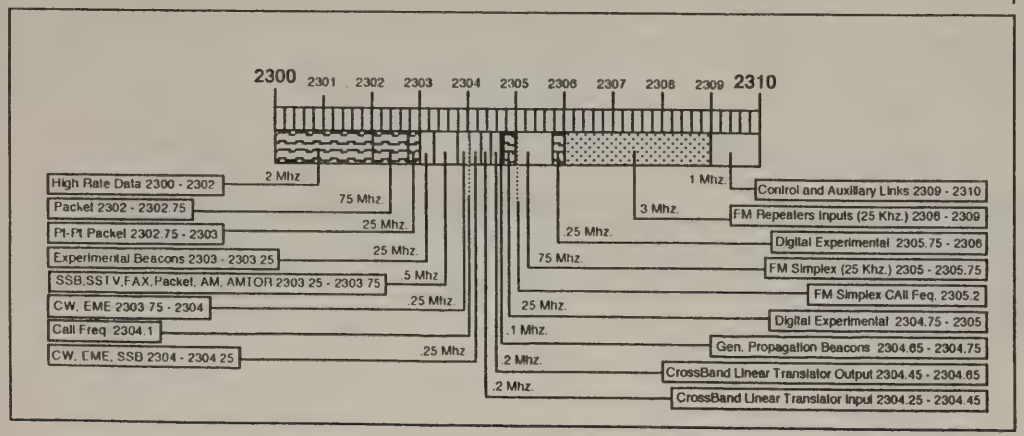


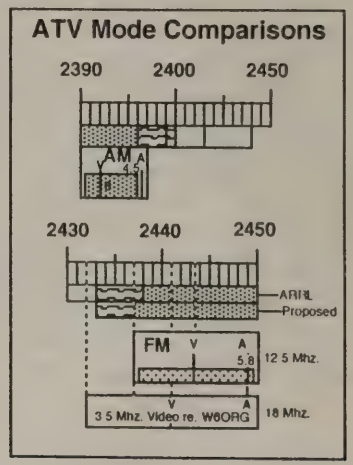
# NTSC PROPOSED BAND PLANS



# Proposed 13 cm Band Plan
## 2300-2310 and 2390-2450 Mhz.



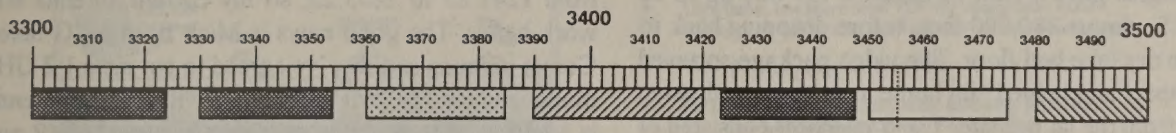



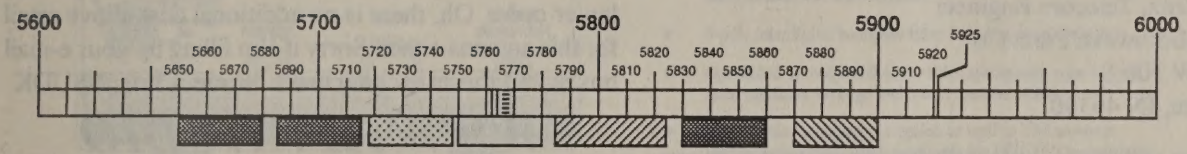
# *NTSC PROPOSED BAND PLANS*

## 3300 to 10,000 Mhz. BAND PLANS PROPOSAL

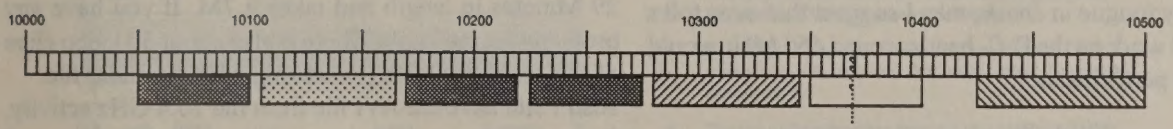
### 3300 - 3500 Mhz.




### 5650 - 5925 Mhz.




### 10,000 - 10,500 Mhz.




Propagation Beacons
Narrow Band Calling Frequency
ATV
Point-to-Point
Weak Signal
Digital
Voice

# *ATV ALTITUDE RECORD*

It looks like Mike Henkowski KC6CCC owns the ATV altitude record after a rocket launch Saturday Nov 23, 1996 at Black Rock, Nevada. His 2417 MHz ATV signal gave a view of Earth all the way up to 53 MILES, almost 280,000 feet, before dropping back to hit the dry lake bed floor. The video package survived the impact and helped him home in on the signal seven miles from the launch site. The transmitter consisted of an FM ATV exciter, originally designed by Mike at his company, Microtek, for part 15 license free use, driving a home brew 1 watt amplifier. 73 W6ORG

## COAX LOSS FOR LMR SERIES

Alan Rutz, Telecom Engineer
SHF Microwave Parts Co.
7102 W 500 S
LaPorte, IN 46350

Times LMR-240 1/4" foam, good to 31 GHz, loss at 450 = 5.28 dB, $0.33/ft
Times LMR-300 1/2" foam, good to 12 GHz, loss at 450 = 2.15 dB, $0.70/ft
Times LMR-600 1/2" foam, good to 10 GHz, loss at 450 = 1.72 dB, $0.94/ft
Times LMR-900 5/8" foam, good to 7 GHz, loss at 450 = I .12 dB, $2.64/ft
Times LMR-1200 7/8" foam, good to 5 GHz, loss at 450 = .89 dB, $3.46/ft
Times LMR-1700 1.25" foam, good to 3 GHz, loss at 450 = .63 dB, $5.60/ft

I think common "N" connectors (and even UHF connectors) work on selected cables of this family, such as the LMR-240 or the LMR-500.

With my tongue in cheek, may I suggest that even folks who still work on the D.C. bands around 450 MHz would like this performance?

# *ANOTHER ATV WWW*

***Darrell Montgomery KC5CCQ writes, ," This page has a lot of stuff for ATV stuff, HTTP// WWW.SCX.COM/***

# *COMET ATV ANTENNA*

Well, my quest for a good 1.2 Ghz antenna for ATV has paid off! For anyone who has an ATV input or output in the 23cm band, you're probably aware the omnidirectional antennas like the ones Diamond and Comet make don't favor the lower part of the band (1241.25 and 1253.25). I've bumped my repeater output from 1241.25 to 1253.25, so my current antenna will work better. The good news is Mick from NCG faxed Comet in Japan and they've agreed to cut me a 1.2 GHz monoband for 1247 MHz. The bandwidth of the antenna is 30 MHz wide so this should give me great SWR and gain for either 1241.25 or 1253.25! I'll stick with my 1253.25 output, but I think the antenna will work better and if I decide later for 1241.25, I'll have no problems.

It'll take six weeks to get the thing, but I'll test it out, and if anyone is interested, I can post the results. I assume NCG prefers larger orders than mine, bit if it works well and people are interested, we could place a larger order. Oh, there is no additional cost above retail for this antenna either. Sorry if I'm filling up your e-mail boxes, but this is exciting news for me. Chris, N8UDK

# *WWW ATV AUDIO*

To all ATVers,

Since I have obtained a WEB page I have been experimenting with HTIVIL. I have now placed on my WEB page a Real Audio file from the Amateur Television Network (ATN) Santiago Peak ATV repeater net held this last Tuesday. Since my Internet provider does not have a Real Audio server then you will need to download this file first and then load it into your Real Audio player. It is 29 Minutes in length and takes 1.7M. If you have any problems let me know. There is also about 30 video clips of the net as well that goes along with the audio file.

Also I still have the AVI file from the 10.4 GHz activity. Some people were having problems downloading and playing this file. It was a AVI file to reduce space. It compressed it from 1.7.M to 1.4M. This seemed to cause some WEB browsers problems. So I have instead posted the AVI file itself. Let me know if you have better luck downloading this.

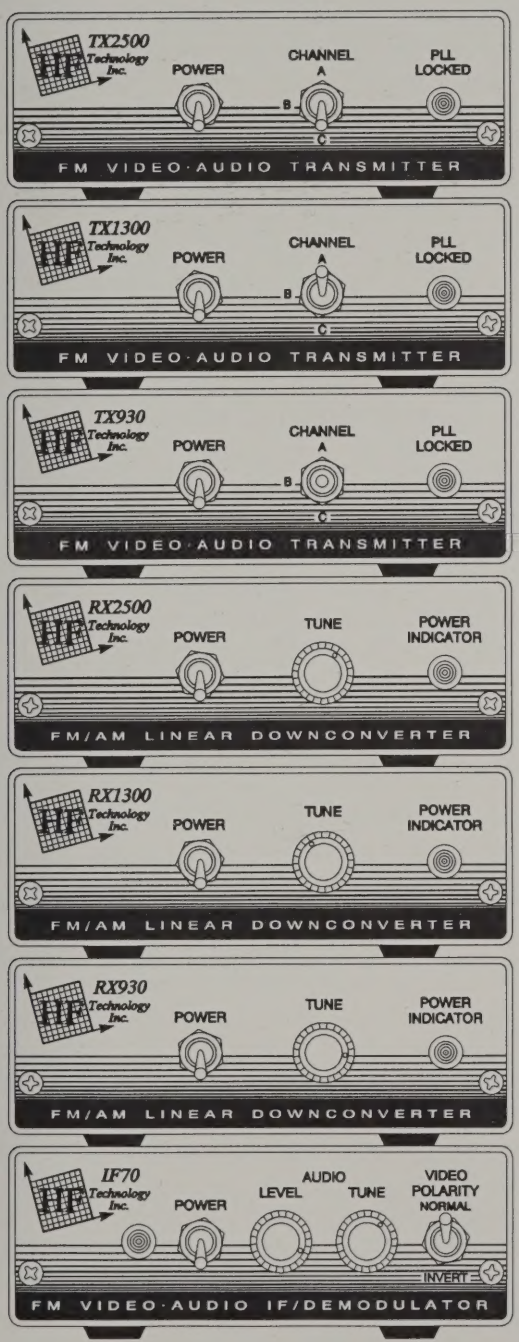
As I said I am just learning so if you have problems or something does not look right then drop me an email. The web site is:

http://web.io-online.com/users/forsberg/atv.htm

73,

Bruce Forsberg WB61ZG

HIGH FREQUENCY TECHNOLOGY INC.
457 SANTA FE TRAIL, CARY, IL. 60013-1981
Telephone & FAX Number (847) 639-4336




## *TX2500, TX1300, and TX930*

- Conservatively rated modular 1 Watt RF output stage.
  (0.5 Watt GaAs power amplifier on the TX2500)
- Fully synthesized channels covering the entire amateur band:
  2390 to 2450MHz for the TX2500
  1240 to 1300MHz for the TX1300
  902 to 928MHz for the TX930
- Ultra linear, low phase noise VCO for unsurpassed video quality never before seen in an amateur television transmitter.
- Video frequency response from 10Hz to over 4MHz .
- Built-in 5.8MHz high fidelity audio subcarrier generator.
  (internally adjustable from 4.5 to 6.5MHz)
- Audio Frequency Response from 10Hz to 15kHz

## *RX2500, RX1300, and RX930*

- Low noise unconditionally stable MMIC front-end amplifier for sensitivity, stability and reliability.
- 2-pole interdigital front-end preselector filter to reduce out of band interference and overload.
- 6-pole interdigital bandpass filter for great image rejection.
- Optimized IF output filter provides spectacular rejection of local oscillator leakage and low dispersive effects.
- AM amateur television reception as well as FM amateur television reception when used with the IF70 IF/Demodulator.
- Low phase noise local oscillator resulting in unrivaled on channel sensitivity and adjacent channel interference rejection.
- Greater than 80dB linear dynamic range with virtually no spurious outputs. (The signals at the IF output are really received and not generated within the downconverter.)

## *IF70*

- The only FM video-audio IF / Demodulator specifically designed for FM amateur television use.
- Phase-locked loop video and audio demodulators "lock" on transmitters with frequency drift and maintain the utmost picture clarity.
- Tune in audio subcarriers from 4.5 to 6.5MHz (4.5MHz ceramic filters optional) with "Hi Fi" broadband response.
- Tight IF selectivity provided by a 16MHz wide Surface Acoustical Wave (SAW) filter.
- Optimal differential gain and phase response through the use of linear phase filtering in both the IF and base band circuitry.

**Call or write for complete specification sheets, ordering information and current pricing on these and other products.**

***Engineered and Manufactured Entirely in the U.S.A.***

HIGH FREQUENCY TECHNOLOGY INC.

P. C. Electronics 2522 Paxson Lane Arcadia CA 91007-8537 USA
Tel: **(818) 447-4565** m-th 8am-5:30pm pst (UTC - 8) Tom (W6ORG) & Mary Ann (WB6YSS) O'Hara
24 hr FAX order line (818) 447-0489 Email: tomsmb@aol.com
Web site: http://www.hamtv.com

# TC70-10 ATV TRANSCEIVER

**VALUE PLUS QUALITY FROM OVER 30 YEARS IN ATV**

**ONLY $499**

**Total price shipped within 24 hrs of your call UPS surface in cont. USA, Visa/MC**

**All in one box**
**420-450 MHz BAND**
**RUGGED**
**RELIABLE**

**≥10 Watts p.e.p. Output -Adjustable**

**Made in USA**

## TC70-10 Transceiver lets you get on ATV right away with all the power most will need in one box - *90 Miles line of sight DX

ATV is no more difficult or different than any voice mode except that you also plug in your camcorder to transmit, and your TV set to receive the picture. That's it - you're seeing as well as talking to other hams live and in color! No other radios needed.

You can show the shack, home video tapes, zoom in and describe projects, show computer graphics and programs, repeat SSTV or even Space Shuttle Video and audio if you have a TVRO. Go portable or mobile, do public service events, RACES, AREC, CAP, even transmit the radio club meetings to those hams that can't make it.

*DX is up to 90 miles snow free line of sight using 14 dBd beams and 100 ft. of Belden 9913 low loss coax simplex. Check the ARRL Repeater Directory for ATV repeaters in your area or call us for info on other ATVers in your area.

Transmitting equipment sold only to licensed Tech class or higher Radio Amateurs, verified in the Callbook, and used for legal purposes per 47 CFR part 97. If newly licensed, moved or upgraded, mail or fax a copy of your license or test certification.

- **Adjustable peak envelope power RF output**
  Typical range from 2 to ≥10W and sync stretcher allows proper adjustment to fully drive the RF Concepts 4-110 or Mirage D1010-ATVN to full 100 Watts p.e.p., without sync or audio clipping.
- **Separate mic and line audio volume controls**
  Allows voice over commenting when showing video tapes.
- **Rugged 7.5x7.5x2.7" black die cast alum. box**
  Continuous duty for public service applications. Takes up less space on the operating table than 1 Watt plus amp. 3.5 lbs.
- **True Final RF detected video monitor output**
  Lets you set the video gain control for actual white level in your video monitor. Camera video is at this phono jack during receive for focus & lighting set up before transmitting.

Front panel phono jacks accept composite video and line audio from your camcorder or VCR. Mini jack for low Z dynamic mic & submini PTL (push to look). Type N antenna jack on rear panel. Sensitive GaAsfet downconverter tunes whole 420-450 MHz 70cm band down to your TV channel 2, 3 or 4. Comes with one crystal you specify on 439.25, 434.0, 427.25 or 426.25 - F1. 2nd switch selectable crystal, F2, add $20. Requires 12-14 Vdc @ 3 Amps. 100% duty cycle.

## COMPLETE 420-450 MHz 70cm BAND ATV STATION

Your TV set

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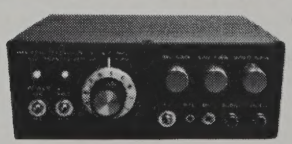

**TC70-10....$499**
**ATV Transceiver**
**10 Watts p.e.p. min.**
**Downconverter tunes 420-450 MHz**
**Req. 12-14 Vdc @ 3A power supply**
**Specify transmit frequency(s):**
**439.25, 434.0, 427.25 or 426.25 MHz**

+

Optional 100 Watt Amplifiers

**RF Concepts 4-110.....$359**
**Mirage D1010-ATVN ...$369**
**Amps require their own 13.8 Vdc 25 Amp regulated power supply**

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Antennas - see catalogue page 5

| | | | |
|---|---|---|---|
| Dir. Sys. | DSFO ATV-25 | 16 dBd | $149 |
| KLM | 440-16X | 14 dBd | $142 |
| KLM | 440-10X | 11 dBd | $82 |
| KLM | 440-6X | 8.9 dBd | $65 |
| AEA | Isopole V omni | 3-4 dBd | $99 |

Your video camera or camcorder

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**HAMS: Call, Write or Email for our complete ATV Catalogue - We have it all!**